NATURE MAGAZINE

JANUARY 1925

QH
1
N52

SINGLE COPIES 35 CENTS

THE TREE PLANTING ARMY

The tree planter of today is the benefactor of tomorrow.
—Charles Lathrop Pack, President, American Tree Association.

At Omaha, Nebr., the Major Isaac Sadler Chapter of the D. A. R. is planting the Military Road with memorial trees. The members have placed 63 trees and hope to have 200 in by spring. Mrs. Paul S. Fleming and Mrs. Byron Hart are directing the work.

At the direction of Barbara Ellen Joy of the headquarters of the Camp Fire Girls in New York City, forestry data are being placed before the members of that organization. The American Tree Association invites all Camp Fire Girls to send for tree-day programs and tree-planting suggestions.

Conservation committee chairmen of the Oklahoma State Federation of Women's Clubs met in Oklahoma City in December following the call of Mrs. F. B. Hancock, the conservation chairman. Forestry data of the American Tree Association were distributed and plans made for a state campaign of education.

Troop 10 of the Portland, Oreg., Boy Scouts are all members of the tree-planting army. T. Neil Taylor has registered every one of them in the Association following the planting of trees.

In honor of Mrs. Albert Ritchie, mother of the Governor of Maryland, the State Federation of Women's Clubs planted a memorial tree on the grounds of the state capital at Annapolis. Mrs. John F. Sippel, the state president, made the presentation of the tree to Mrs. Ritchie and the Governor.

The women's club of Port Clinton, Ohio, has made forestry a part of the program for the year. Mrs. M. G. Sloan has that feature of the program in charge.

High School students of Milwaukee have under way a plan to buy 4,000 acres of virgin timber land in Sawyer County for a state park. The American Tree Association congratulates the school pupils of the state on enlisting in this move. The plan calls for every school pupil in the state contributing a small sum to the purchase price of the land.

A forestry conference was held in Indianapolis early in December at which Charles Lathrop Pack was one of the speakers. The Department of Conservation, of which W. A. Guthrie is the chairman and Richard Lieber the director, hopes to make Indiana a leader in cooperative legislation following the passage of the McNary-Clarke Forestry bill.

The senior class of St. Simon Academy of Washington, Ind., is studying the forestry question, the class being one of the first to send for the booklet, "If the Nation Save the Trees the Trees Will Save the Nation."

Members of the Idaho Women's Clubs are discussing forestry and kindred subjects. Mrs. L. D. McFarland, the secretary, has sent for forestry data on which she based a paper on "The Wealth of Our Forests."

P. I. Stovall of the Brau's Chapel School of Attalla, Ala., asks the American Tree Association for tree-planting information for a tree-day program there.

At New Iberia, La., Mrs. W. G. Weeks of the Parent-Teachers' Association, put on a tree-day program in the schools.

"A tree in every back yard" was the slogan at Vancouver, B. C., by which a tree-planting campaign was inaugurated there.

A memorial tree in honor of William Harrison Earles has been planted by the Elks and the American Legion at Bellingham, Wash. The tree has been registered on the honor roll of the American Tree Association.

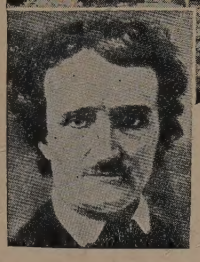
One of the biggest tree-planting programs in the country is being carried out by the people of Marinette, Wis., in cooperation with the *Eagle Star* of that city. Every one in the community is to have a part in the planting along a Road of Remembrance of 1,200 memorial trees.

Dedicated to the soldiers and nurses of Youngstown, Ohio, 59 memorial trees have been planted on a Road of Remembrance. The program arranged by the Federation of Women's Clubs was carried out with the help of the Boy Scouts, American Legion, Camp Fire Girls, and Veterans of Foreign Wars. Mrs. U. F. Kistler presided, while Mrs. Newton Allensworth of the Auxiliary, presided at the dedication. Others on the committee were Mrs. Thomas C. Muldoon, Mrs. W. R. Graham and Mrs. J. H. Middletown. Six Camp Fire Girls in Indian costume recited Kilmer's famous poem "Trees."

Boy Scouts of Ashland, Ky., are studying trees under the direction of Glenn James, of the Municipal Recreational Commission. Prizes will be awarded the boys identifying the most trees.

The only way to join the American Tree Association is to plant a tree and register it with the Association, 1214 Sixteenth Street N.W., Washington, D. C. The Association will send tree-planting suggestions and a tree-day program for two cents to pay postage. Make your spring tree-planting plans now.

The supreme love
and the supreme tragedy
of Poe's life



Copyright A. G. Learned

Virginia, Poe's wife, and the inspiration of "Annabel Lee," from the water color sketch by A. G. Learned. At left, the Fordham cottage as it looked when the Poes lived there. Extreme left, portrait of Poe in his room at the University of Virginia, photo by Holsinger. Pictures by courtesy of The Mentor.

"For the moon never beams without bringing me dreams Of the beautiful Annabel Lee"

IN his hauntingly beautiful poem, "Annabel Lee," Edgar Allan Poe immortalized his love for his "child wife," the gentle, delicate creature whose devotion furnished the one bright chapter in his ill-starred life.

And even in this, the tragedy which seemed to dog his every step came to rob him of his happiness—

". . . the wind came out of the cloud by night
Chilling and killing my Annabel Lee."

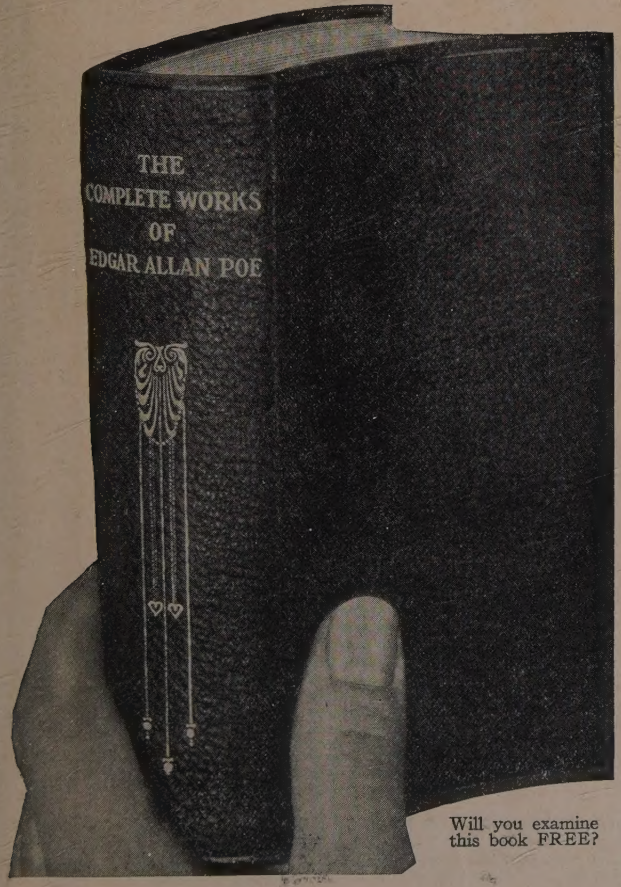
Poe's wife died in the little Fordham cottage, sharing to the end the bitter poverty of her genius husband. He had no money even to buy a coverlet for her when she lay at the point of death.

Never was there a more unhappy mortal than Poe. But today the genius of this unparalleled master is appreciated as never before. He has his place in the Hall of Fame. A splendid monument in the Metropolitan Museum of Art, New York, bears the fitting inscription: "He was great in his genius; unhappy in his life; wretched in his death. But in his fame he is immortal."

And now a new tribute is paid to Poe in the publication of a remarkable new edition of his works—unlike any ever published before, for it includes everything he ever wrote complete in ONE superb volume!

A sensational achievement in publishing makes this marvelous volume possible. Think of a complete Poe library in a single, light, convenient-sized book—everything that could be obtained in a set of many volumes. Here are his thrilling detective stories, his gripping tales of mystery and terror, his witty narratives, his hauntingly beautiful poems. In addition, there are fascinating introductory articles by eminent authors, many of whom knew Poe personally.

The complete works of Poe in this ONE volume



Will you examine this book FREE?

How can so much be included in ONE handy-size volume? The secret is simply this—*genuine India paper* is used, so finely made that nearly two thousand pages are less than an inch and a half thick. Yet it is amazingly strong, pure white and opaque. The type used is NOT small, but large and clear and easy to read.

Moreover, this is a volume as beautiful as it is convenient. It is bound in luxurious, flexible, genuine leather, with gold top pages.

Now you may own the complete works of this great master in this beautiful de luxe form, for only a fraction of the cost of even the cheapest of cumbersome, many-volume sets.

But you must see this amazing volume for yourself. Let us lend it to you for a full week, without cost or obligation. We simply ask that you examine it carefully; enjoy again the irresistible spell of Poe's haunting power.

Then send the book back if you choose, and the week's examination will have cost you nothing; or if you keep it, remit the amazingly small price asked.

But mail only the coupon now. Do this at once, as *the edition is limited.*

The Plymouth Publishing Co.

Dept. 121

7 WEST 42D ST. NEW YORK, N. Y.

The Plymouth Publishing Company,
7 West 42d St., New York, N. Y., Dept. 121

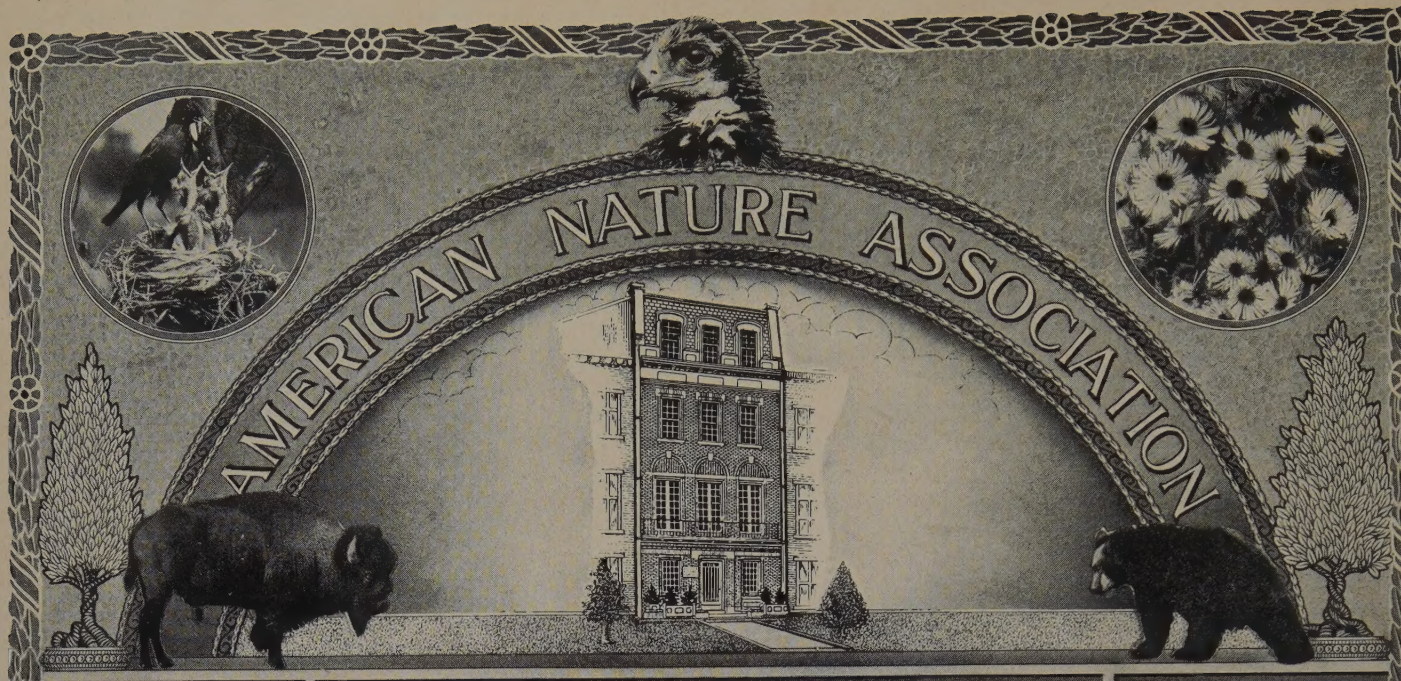
Gentlemen: You may send me for one week's free examination, your one-volume edition of Edgar Allan Poe's complete works, printed in large, clear type on genuine India paper and bound in flexible maroon leather, gold title and gold top pages. I will either send you $5.45 plus the few cents postage in full payment within one week or return the book at your expense.

Name_____

Address_____

City_____ State_____

☐ Mark X here if you prefer your copy bound in Persian Morocco. Add $1.50 to the price. Same approval privilege.



WASHINGTON, D. C.

Organized to stimulate public interest in every phase of Nature and the Out of Doors, and devoted to the practical conservation of the great Natural Resources of America

Officers

CHARLES LATHROP PACK, PRESIDENT — PERCIVAL SHELDON RIDSDALE, TREASURER — ARTHUR NEWTON PACK, SECRETARY

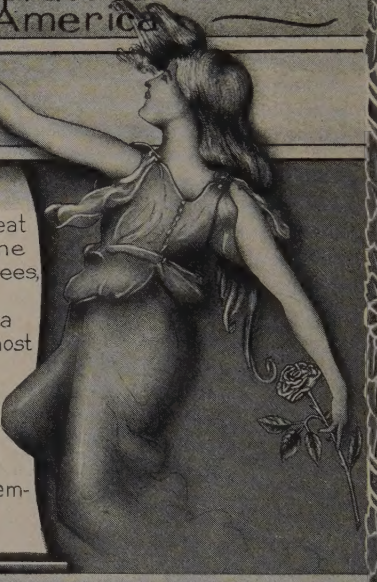
NATURE MAGAZINE

AT LAST, an adequate meeting-place has been provided for the Fraternity of the Great Outdoors. NATURE MAGAZINE has come in answer to a long-felt want - a monthly magazine where the child and the grown-up alike may revel in pictures and stories of birds, trees, beasts, fish, plants and other living, breathing evidence of the Creator's handiwork.

To every man, woman and child who thrills to the chirp of birds, to the friendly wag of a dog's tail, to the woodsy tang of cool, wet moss and the soft rustle of wind through the topmost branches of leafy trees, NATURE MAGAZINE will be a monthly treat.

You will find in NATURE MAGAZINE a publication perfectly attuned to YOUR nature, feeling the things that you feel and expressing your thoughts. You will find instruction through the medium of entertainment. You will agree that here is not "just another periodical," but a publication with a real purpose.

You are urged to send your name and address at once, with $3.00 for membership in American Nature Association, including NATURE MAGAZINE.



AMERICAN NATURE ASSOCIATION,
1214 Sixteenth St. N.W.,
Washington, D. C.

I desire membership in the American Nature Association, including NATURE MAGAZINE each month, and such bulletins and information as are given to members. I will remit $3.00 for one year's dues upon receipt of your bill.

90% of the annual dues is designated for subscription to the magazine

Name.....

Street.....

City.....

January

AMERICAN NATURE ASSOCIATION,
1214 Sixteenth St. N.W.,
Washington, D. C.

I enclose $3.00 for membership in the American Nature Association for one year, including NATURE MAGAZINE each month, and such bulletins and information as are given to members.

90% of the annual dues is designated for subscription to the magazine

Name.....

Street.....

City.....

January

Nature Calendar

JANUARY

With keen expectations we look forward to this new year filled with interesting and delightful contacts with Nature.

The path of the shrew is so delicate that it is almost undiscernible.

"I saw on the hills of the morning,
The form of the New Year rise;
He stood like a statue, adorning
The world, with a background of skies.
There were courage and grace in his beautiful face,
And hope in his glorious eyes."

—*Ella Wheeler Wilcox.*

January is practically the only month of the year when there are almost no arrivals or departures in the bird community.

The rosettes of rattlesnake plantain are cheery bits of midwinter greenery.

January with its snows holds particular attractions for the lover of the out-of-doors. Then are the wanderings of the little creatures of the wild clearly chronicled in fields and woods—tracks in the snow weaving stories, both comedy and tragedy.

Two imprints of feet parallel with each other followed by two in line are the tracks of the rabbit.

The tracks of the red squirrel are smaller, and the footmarks of each of the two pairs are opposite.

The heavy tail of the fox makes brush marks in the snow as he swings from side to side in running.

Often the dainty trail of the whitefoot comes to a tragic ending where are indications of the meeting with owl, weasel or mink.

The Pine tree looks almost black against a background of snow.

Evergreens form a protecting canopy of leaves and snow for many birds and mammals during severe weather.

The bare ground beneath these trees is often the source of food when snow is deep.

Porcupines feed on the bark and twigs of trees, especially the Hemlock and other conifers.

Glistening icicles gayly trim the eaves of houses.

Buck deer are shedding their antlers.

When there is deep heavily crusted snow, field mice often tunnel beneath it and girdle the trees.

The polar bear is sealing in Arctic waters.

Buds are a common item on the menu of squirrels.

Orion is clearly outlined above the southeastern horizon in the early evening hours of this month. Especially brilliant are Betelgeuse and Rigel in this constellation.

Wild birds need our protection in winter.

A piece of suet tied to a tree outside of your window will furnish you entertainment by some of our little feathered acrobats, the chickadees, nuthatches and woodpeckers.

Crumbs, nuts, cracked corn and seeds scattered on a patch of trampled snow may bring you some delightful color combinations in the form of bluejays, evening grosbeaks, goldfinches, redpolls or cardinals.

Food rather than temperature is the greatest concern of birds these days.

The dark green leaves of the wintergreen are hid under a covering of snow.

Buds on the trees, closely wrapped, are promise of the return of spring and positive evidence of the eternity of life.

Prepared for NATURE MAGAZINE by the Cleveland Museum of Natural History

BROWN EYES, SOFT, STARTLED BUT TRUSTING

NATURE MAGAZINE

Vol. V JANUARY, 1925 No. 1

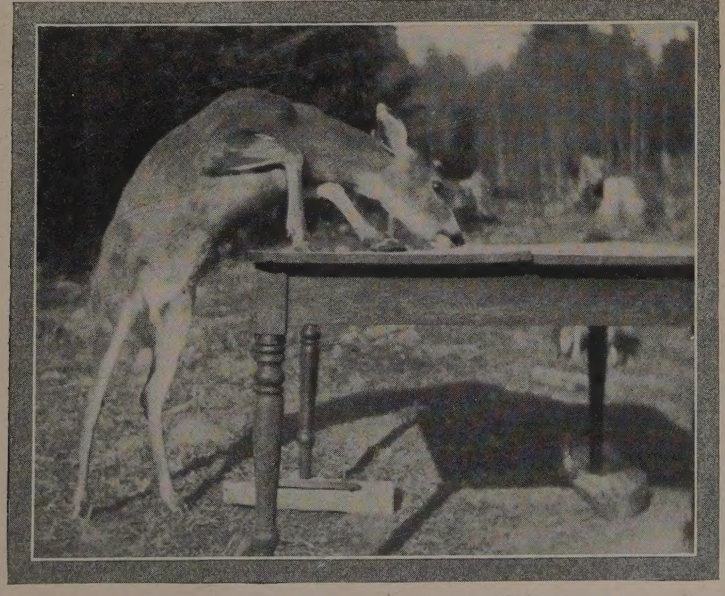
My Friends, the Deer

By TOM BRAZIL

NESTLING with many others in the inner passage of British Columbia, and some sixty miles north of Vancouver, lies Hardy Island. Its three thousand acres are clothed with fir, cedar and hemlock, and its jutting peninsulas and sheltered bays are like those of many another island in the passage. It has a distinction, however, for it is the home of friendly wild deer, pheasants, quail and other citizens of the wild whose lives have not been disturbed by the whistling bullet.

ONE day the American Nature Association Expedition into British Columbia stopped at Hardy Island. There they found Tom Brazil and his deer. So interesting were the things that the members of the party saw, and so interesting was the story that was told them, that they asked this friend of one of the most timid of animals to tell the story to the readers of Nature Magazine.

It was seven years ago that I first came to Hardy Island as caretaker for its owner in faraway England. A short time after I had taken up my lonely existence, I spied a wild deer. I needed friends, so I cut some cornstalks in the garden and set them out on the trail that crosses the island. The deer came for the meal and kept coming to other meals I set out. Apparently the news spread, and by fall there were seven attending the banquet, all of them permitting me to approach closely without being alarmed. The following year increased the number that came to dine to about thirty. Today there are many more, even bringing their fawns with them. After several years, when I stood between my deer friends and a few hunters who failed to appreciate the tameness of the deer, the government of the province has now set the island aside as a reserve and entrusted me with the task of agent.



SOMETIMES TABLE MANNERS WERE BAD

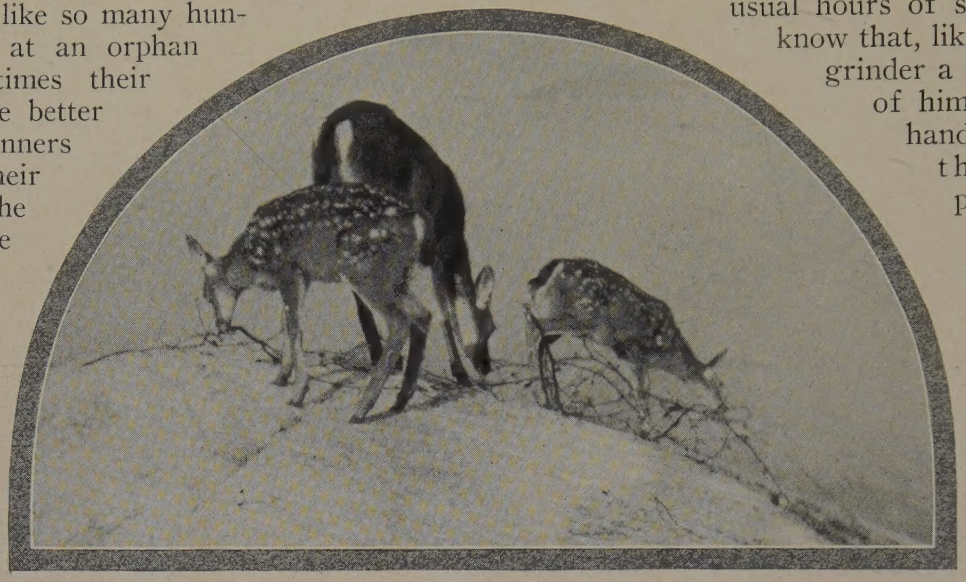
The deer, on the whole, took nicely to man's way of eating at tables.

Once the first timidity was conquered, there came the question of taming them further. Also there came the enjoyment of observing their habits and instincts. Behind the old house that is my home on the island there is a cleared space, well grassed, and with only here and there a granite boulder jutting through. This became the dining-room of my deer friends. Late in the afternoon they gather here, having awakened from their daytime sleep with healthy appetites.

One day I built a long

wooden table and set places with tin plates on it for the deer. It was not long before they were accustomed to nuzzle away at their meals of shorts or bread like so many hungry youngsters at an orphan asylum. Sometimes their appetites got the better of their table manners and they put their front feet on the table. On the whole, however, they took nicely to man's ways at mealtimes.

Four of the deer have found that they can get fed between meals by using a little insistence. They come down to the house and rattle the back door knob with their noses and paw its panels with their forefeet. They refuse to respect any usual hours of sleep and seem to know that, like giving an organ grinder a shilling to get rid of him, they will get a handful of shorts for the same purpose. As the news of these deer has spread and knowledge of the beauties of the British Columbia coast has increased, there are more visitors every year to Hardy Island. If they come ashore in the

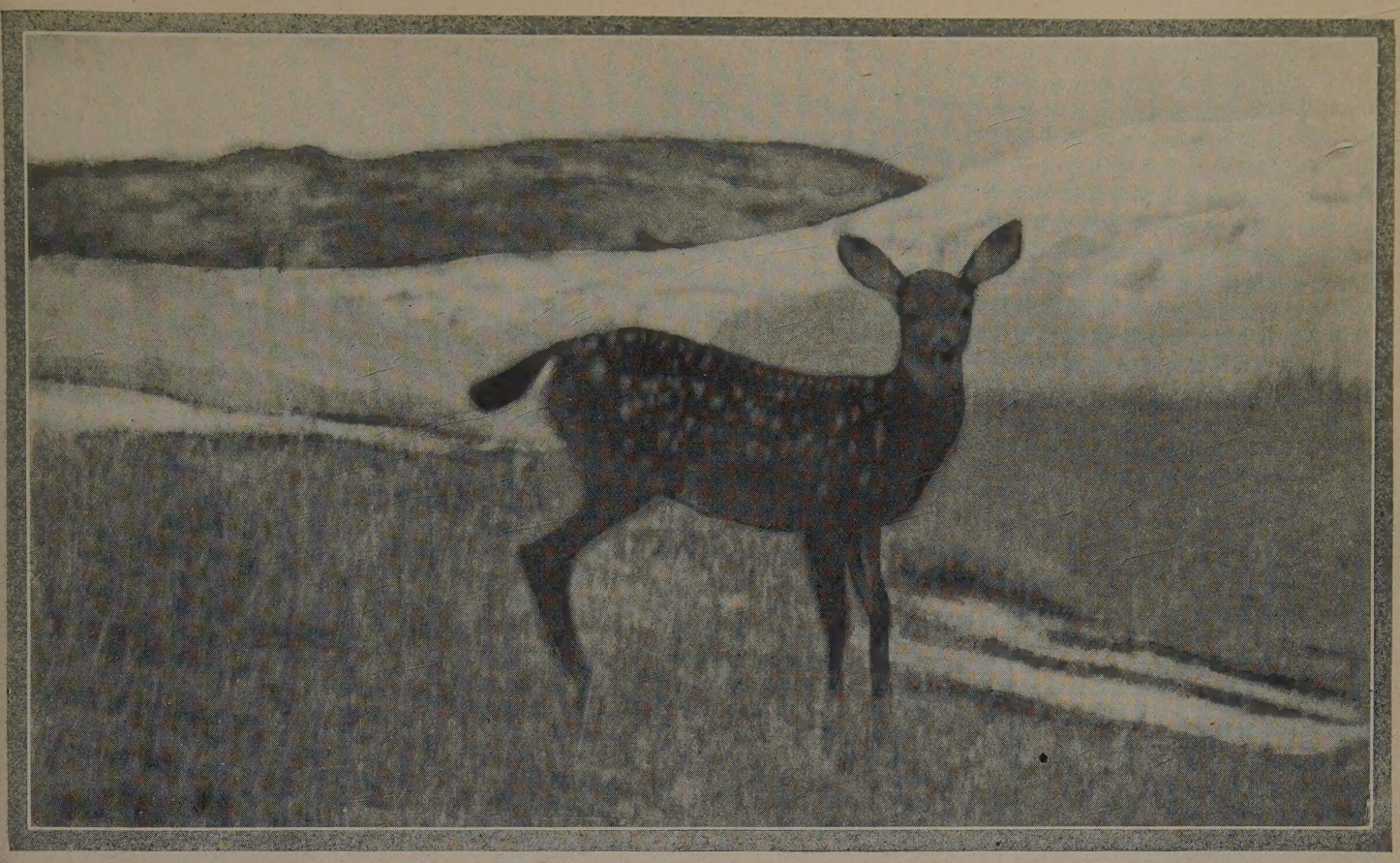


SOMETIMES TWINS WERE BORN

Mother deer, with two fawns, nibbling at vines on one of the rocky promontories of Hardy Island.

SOMETIMES THE BUCKS CHALLENGE EACH OTHER TO COMBAT

They are fierce fighters, and will snort, bristle and charge each other, locking horns in battle.

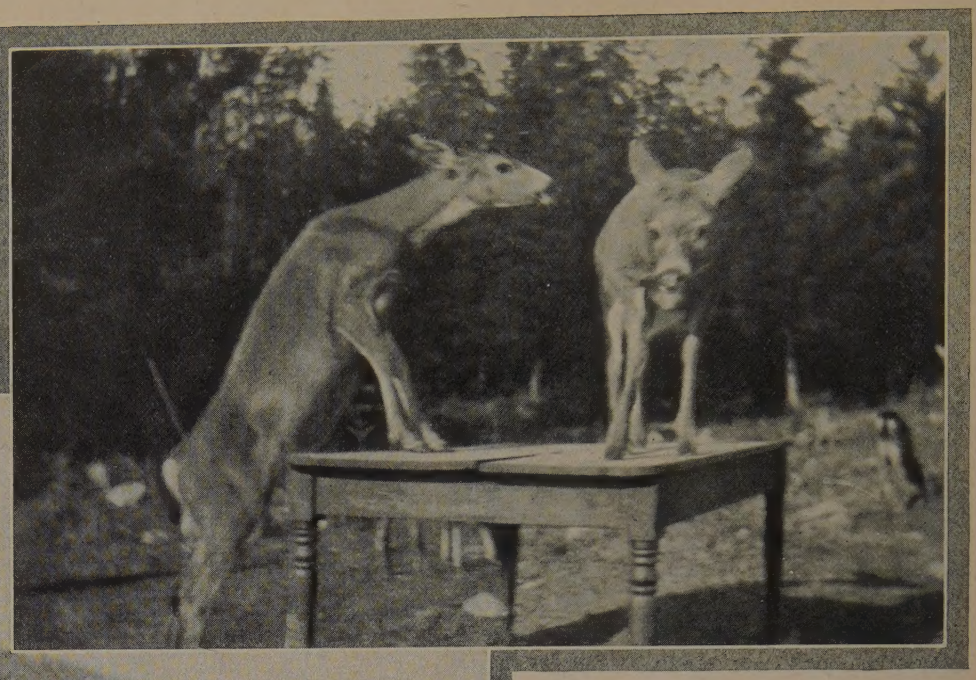


READY TO DART AWAY AT STRANGE ADVANCES

When the mother deer comes down to feed she shooes her fawn into the thicket for safety.

TIED TO MOTHER'S APRON STRINGS

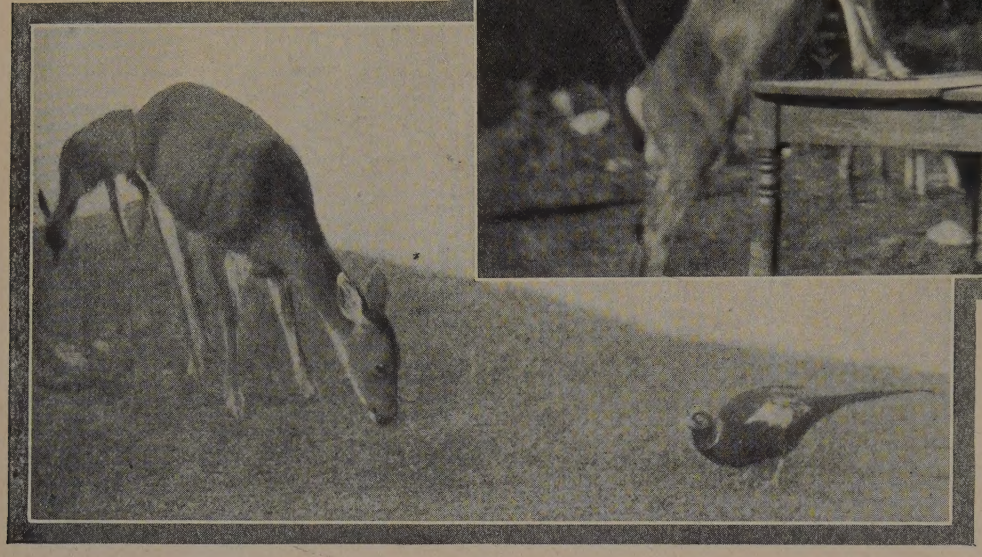
The little fellow stays close to the doe, who sends it into hiding in the thicket if danger threatens



RIGHT

DINNER IS OVER

To be sure a close inspection of the table is made.



LEFT

ALL GET ALONG NICELY

Bird and deer feed contentedly together on Hardy Island.

LEFT

A BIT OF PLAYFUL COMBAT

Sometimes it is not play and there are casualties of battle.

RIGHT

NIBBLING AND PECKING TOGETHER

Hardy Island is peopled with quail and pheasants.

THE BUCKS INTERESTED IN THE CAMERA

Their horns are full grown by the middle of August, but the time they shed them varies each year.

afternoon and the deer are within sound of the voice, the visitors will meet them personally. Gradually in response to my loud, "Co Boy," which from long exercise carries far into the woods, the deer will come sauntering down to the back yard, a buck here, a doe there. If it is a time of year when the fawns are young, more than likely the mother will leave her offspring in the concealment of the high ferns and undergrowth and come down alone to inspect the visitors. On the least advance, the little spotted fellow will flash away into the deeper woods.

BRAZIL AND ONE OF HIS DEER

They will stand on their hind legs or climb one's knee for delicacies.

So tame are the deer that they will frequently submit the top of the brown, silken heads to be scratched. With their hard and sharp little feet they will climb on the bended knee of a visitor and stretch their pretty necks and heads to reach the piece of bread or other delicacy held aloft. Sometimes jealousy and competition enter into this show-off mealtime and there will be a bit of butting of one another and the toss of a peevish antler. Then, perhaps, we will go up the rough trail to cut a young alder for dessert of leafy browse, the deer daintily picking their way along, and making a beautiful picture against the thick growth of the woods and the tangle of the underbrush.

These deer are the Columbian or coast deer, members of the blacktail species of the Pacific slope. Frequently the deer of the islands north of me are smaller than those of the mainland. It is believed that in the past, when the deer were more abundant, they wandered and spread out as do people. The younger and weaker were driven out by the older and stronger and, swimming readily, they traveled from island to island. Later the numbers decreased and, with plenty of food and shelter, the deer remained within the boundaries of the islands. This led to inbreeding, perhaps accounting for the smaller size.

The time at which the deer shed their horns varies a little each year, sometimes coming as early as the fifteenth of December or as late as March. The mating season generally begins the first week in November, running to January, and the fawns appearing in June or July. Frequently there are twins, and I have one doe that has had six fawns in four years.

In the rutting season the bucks sometimes become troublesome. One once forced me up a tree but later seemed to be extremely sorry and apologized by coming down the hill every night when all was still and bleating to draw my attention. The bucks are fierce fighters. Sometimes they challenge each other to combat by snorting, bristling like a dog and charging each other. Frequently they lock horns, and once I had to cut off a part of the horn to separate two combative bucks. The horns are full grown by the fifteenth of August, dropping the velvet and leaving them brittle for awhile.

As wild companions to my deer, about three years ago I placed some quail on the island. Now they scurry through much of the underbrush and come to my call. There are pheasants, too, in the thickets, and all get along nicely together.

So the deer of Hardy Island have become known to those whose pleasure it is to travel the inner passage of British Columbia. The island and its two nearby ones, Nelson Island and Captain Island, have been set aside as government preserves and the deer can roam at will, meeting humans now and then in safety.

MEMBERS

Pay your membership bills before Jan. 15, 1925, and save $1.00

New subscribers to NATURE MAGAZINE in 1925 and new members of the American Nature Association will pay $3.00 per year.

Present subscribers and members who renew before Jan. 15, 1925, will receive their magazine in 1925 for $2.00.

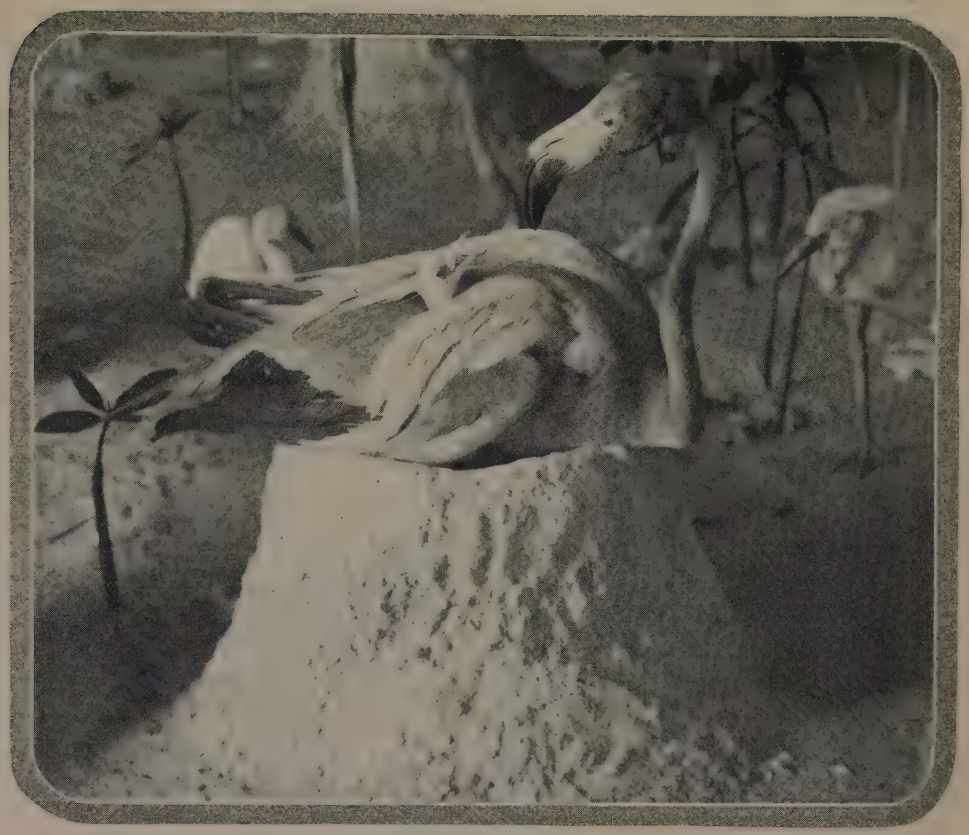
If their bills, however, are unpaid by Jan. 15, the $3.00 rate will apply to them.

The increase in price is due to many improvements in the magazine for next year, including handsome color pages which will start with the February issue.

The Vanishing Flame-colored Flamingo

By CATHERINE BEACH ELY

(PHOTOGRAPHS BY COURTESY OF AMERICAN MUSEUM OF NATURAL HISTORY, FROM GROUPS IN THAT INSTITUTION)



AMERICAN FLAMINGO ON NEST

Note the young clamoring for food and the odd way in which the parent bird can twist its long neck.

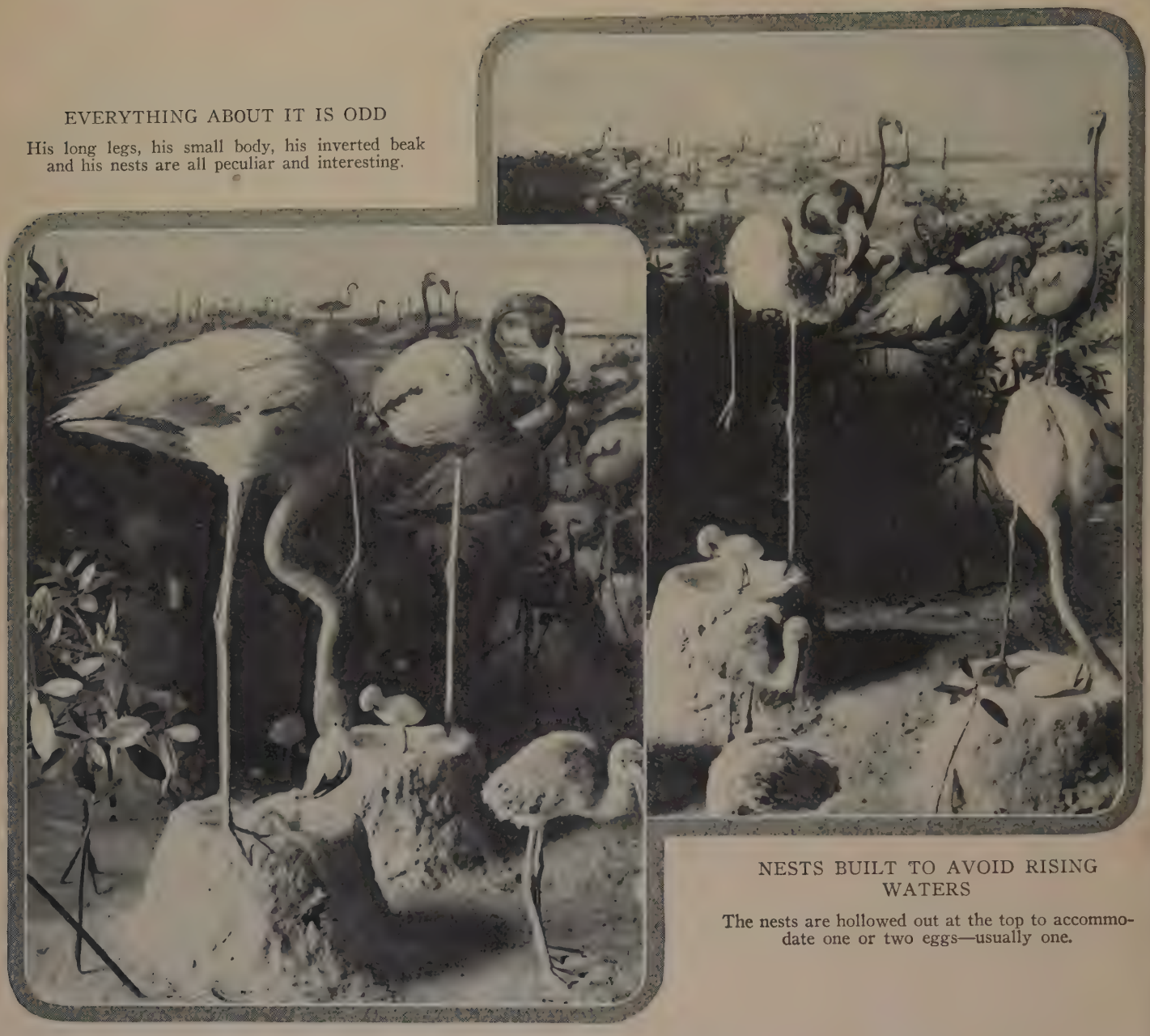
ONE OF the most wonderful birds in the world, the flame-colored flamingo of America, is extinct except for a colony of twelve hundred on the Andros Island in the Bahamas. Bird-lovers rejoice because Mr. T. Gilbert Pearson, as the result of a trip to the Bahamas in 1923, has succeeded in making the southern part of the Andros Island a reservation for these feathered victims of a persecution which has gone on down the ages. Flamingoes' tongues stimulated the jaded appetites of the Romans at their banquets. Their brilliant plumage has been an easy mark for sportsmen and aroused the greed of commercial caterers to milady's chapeau. Their tender flesh tempts the natives. Eviction from stronghold after stronghold has been the price these harmless birds have paid for their attractiveness. But at last the government protects them.

The flame-colored flamingo excels in oddity, distinction and color. His small body set high on slim legs, his aquiline profile, long swanlike neck and gorgeous plumage make him extremely decorative. His rose-red wing feathers are offset by black quills. Naturally the male flamingo, according to the rule in birdland, is the showy member of the family, the female contenting herself with pale pink and the young appearing in inconspicuous brown when they are old enough to run around, though they are born pure white.

Everything about the flamingo is odd. His bent beak ladles up the mullusks, worms, small fishes and seed which float in the watery mud of his habitat like noodles in soup. Fine transverse ridges in his upper and lower mandibles and little bony spines on his tongue enable him to hang on to what he gets. He stalks about in the salty ooze of the marsh, stirring up the water with his webbed feet. He turns his head upside down, spoons up his mud porridge, sifts it through his bill, retaining whatever appeals to him, then raises his long, slim neck and swallows the tidbits with gusto. Flamingoes' nests are as peculiar looking as the birds themselves. To avoid rising water they mold mud cones a foot high, more or less, and hollow them at the apex to accommodate one or two eggs—usually one.

Not "the missing link" but "the connecting link"—between wading birds and swimmers—is what Mr. William T. Hornaday, director of the New York Zoological Gardens, calls the flamingo. He says this queer bird has legs like a heron's, feet like a duck's, a neck like a crane's and a bill with a broken back like a shoveller-duck's. He describes the flamingo's voice as "fearfully and wonderfully made, a rasping blast like a large tin horn blown by an amateur." Others characterize it as a "goose-like honk" or a "deep nasal voice."

Owing to his small body the flamingo does not look the five or six feet he actually measures from the tip of his beak to his toes. He frequently carries his neck in the form of a letter *s*, but when on the alert he raises it like a tall coral



EVERYTHING ABOUT IT IS ODD

His long legs, his small body, his inverted beak and his nests are all peculiar and interesting.

NESTS BUILT TO AVOID RISING WATERS

The nests are hollowed out at the top to accommodate one or two eggs—usually one.

vase. In flying, each flamingo follows the end of his beak, spreads his flaming wings and trails his legs straight behind him, making a picturesque silhouette against the sky. The flamingo's sunset plumage, his unique contours, his unusual habits, and the strange, lonely, hot regions he inhabits make him a bird of mystery, fascinating to sportsmen and scientists. In color and originality of form he leads birdland's élite. He puzzled ornithologists for a long time, but they have fixed a pedigree for him, assigning to him a distinct order (Odontoglossae), his name being nearly as long as he is.

The color of the flamingo flames highest in a tropic setting. In captivity, at the first moult, the glow of the wings, the brilliant pink of the body and neck fade white, with only a flicker here and there of former fires. Captive flamingoes live on dried shrimps, boiled rice and cubes of stale bread served in water. Dr. Hornaday says that, since their last flamingoes died, it has been impossible so far for the New York Zoological Garden to obtain others, as very few come into the bird market. He adds that when they settle down in captivity they get along very well.

When Mr. Frank M. Chapman of the American Museum of Natural History called on the flamingoes in 1902 on the Andros Island, he was received, after much difficulty in getting an introduction, by seven hundred birds keeping house on a mud flat furnished with two thousand mud nests, located near a lagoon. He pronounced it "the most wonderful sight in the bird world." Flamingo-flocks used to visit Florida, but they

NOT THE "MISSING LINK" BUT THE "CONNECTING LINK"

It is said the flamingo has legs like a heron's, feet like a duck's, neck like a crane's and a bill with a broken back like a shoveller-duck's and a voice like a large tin horn blown by an amateur.

were too attractive to survive covetous bird-slayers.

We will visit a flamingo colony set like a flaming garden by a pale lagoon (see illustrations). A fine male looks the world in the face, upright on vermilion stilt-like legs. Nature has painted his beak vermilion, white and black and dashed a little black against the fire of his wings. Nearby a flamingo, standing on the edge of the nest, combs its back feathers with a twist of the slender snake-like neck. Another undulates the neck to feed a little one. Bending long legs under its body, one sits on the nest, while a fifth, standing on one leg, stretches its head on the looped neck back to the parting between the wings; each of these poses makes a study in line and color for an artist. Some of the colony are building their nests. They shovel up the mud with their bills and slap it into shape with their webbed feet. Here and there in the hollow of a nest is a big bluish-white egg, or a young one. Little ones, who have not yet come into their heritage of beauty, step about in their brown suits, feeding on spiral shells. A flock of flamingoes in flight is tracing a line of fire now straight, now curving, against the sky.

It is a happy, well-regulated life the flamingo colony leads when undisturbed. The male chivalrously aids the female in incubating. All they want is to rear their young in dignified seclusion and to fulfil their domestic responsibilities free from harassing pursuit.

THE WOLVERINE

This solemn-faced member of the marten family has so voracious an appetite that he is frequently called "the glutton."

The Wolverine, Sometimes Called the Glutton

By WILLIAM MACMILLAN

THERE is in the writer's possession a particularly well-mounted specimen of a huge wolverine. Measuring forty inches from the tip of his blunt nose to the end of his curiously stunted tail, the great fellow stands guard at my library door, greeting every visitor with the same cold, passionless stare that characterizes him in actual life. And, strange to say, not one individual in twenty—no, not one in fifty—can even name my mounted friend correctly. Some call him a fisher, others a wolf, and some a bear. And all this despite the fact that a whole great state in the Union was once named after him, as is one of the most palatial express trains on the continent.

To me the wolverine has always been one of the most interesting of all predatory animals from the point of animal study. And while it must be admitted that his unlovely appearance and destructive habits are not calculated to endear him to the average person, yet I do think that his very ugliness of face and form is, like that of the moose, a veritable allurement and attraction in itself to an interested person.

Classed in the marten family, the wolverine of the north country is at once the largest and strongest, but the most lethargic of that oddly assorted family. But it is quite evident that he hasn't always been so deliberate and sluggish of movement. Even a casual observation inclines one towards the theory developed by certain scientists that there was a time, long years ago, when this curiously formed mammal could run and leap with all the ease and agility of a mink or marten. But just as unnatural habits and the passage of time developed the Irish deer into ill-balanced creatures of frail bodies and colossal horns, so this same combination has evolved in the wolverine a strong distaste for hurry, and an equally intense desire to attain by means of supercunning and great strength what formerly required a prodigious amount of wind and speed.

Sad to say, the wolverine is fast disappearing from our northern wildernesses. This solemn-faced,

(CONTINUED ON PAGE 41)

PHOTO U. S. WEATHER BUREAU

BOWED AND BROKEN BY THE WEIGHT OF TONS OF ICE

A scene typical of most of eastern Massachusetts in November, 1921, when a three-day ice storm wrought havoc with shade tree and forest.

The Wonderworld of Ice

By CHARLES FITZHUGH TALMAN

U. S. Weather Bureau

FEW PEOPLE realize the diversity of the icy jewel-work with which Nature, in her winter moods, bedecks the earth. Water in its liquid form has a variety of aspects—in ocean and dewdrop, in cloud and cataract—but it is simplicity itself compared with the kaleidoscopic combinations of crystals that spring into being when the same substance is touched with the magic wand of Jack Frost.

In this age of specialization there are men of science who have devoted most of their lives to the study of ice. One of them, A. B. Dobrowolski, has published a book of nearly a thousand pages about it in Polish. The title, translated, reads "The Natural History of Ice." Though only a small percentage of humanity can read it, the illustrations, the copious bibliographies and a brief French outline at the end are a revelation to anybody who supposes that most of the important and interesting facts known about ice might be set forth, for example, in a short magazine article.

A block of clear, hard ice does not reveal to casual inspection the slightest hint of its complex structure. There are, however, several ways of bringing to view the innumerable starry crystals of which it is composed. One method is to rub the surface with a soft lead pencil or to dust it lightly with soot by means of a soft brush. The substance thus applied fills the slight depressions between neighboring crystals and discloses their outlines. A coating of soot can be used in a similar way to bring out the details of the frost figures formed on window-panes. Another process consists in passing a beam of light through a thin slab of ice and watching the resulting image projected on a screen, or focusing a beam on a point inside the slab and watching the ice itself at this point with a magnifying glass. In either case little shining figures appear, in the shape of six-petaled flowers. Each of these represents an open space in the ice where a crystal has been melted by the heat of the beam, and retains the shape of the crystal. The space is nearly filled with water, but, as ice contracts in melting, a tiny bubble-like vacuum is left at the center of each flower. The spaces and their contents have sometimes been called "negative" or "inverse" crystals.

Ice is not always due to the freezing of liquid water. The ice-crystals that form the high feathery clouds and that fall from them, separately or in clus-

ters, as snowflakes, are produced by the change of the invisible water vapor of the atmosphere directly into the solid state. A mass of dry snow consists, roughly speaking, of one-tenth ice-crystals and nine-tenths air, by weight or volume. Under pressure the air is expelled, and the ice undergoes a process known as *regelation.* It is first melted and then refrozen, so that the crystals form a mass of solid ice. It is by this process that the snow on high mountains or in other regions of eternal cold is gradually converted into the ice of glaciers.

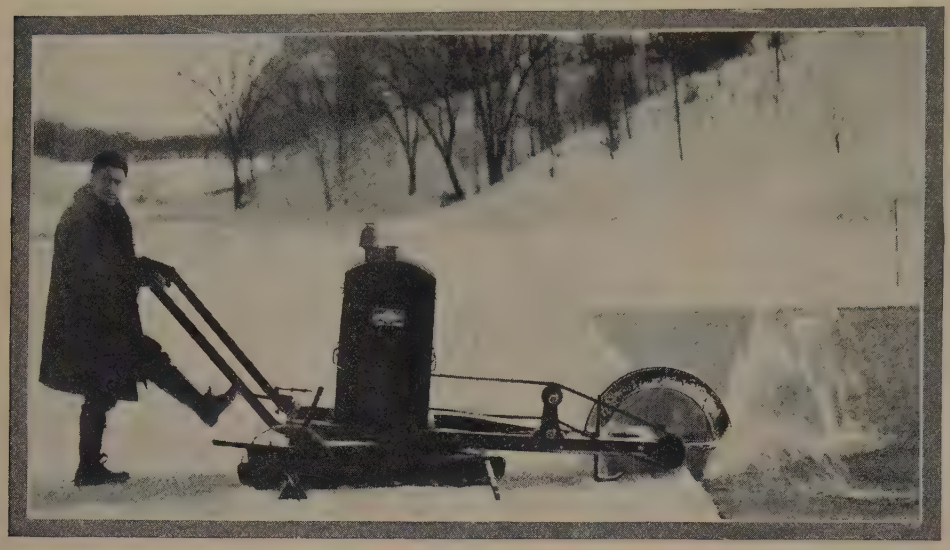


PHOTO GIFFORD-WOOD CO.

HARVESTING ICE TODAY

The power saw cuts the pond's surface quickly into even cakes, supplanting the hand saw.

We have mentioned a big book devoted entirely to the subject of ice. There is a veritable library of books about glaciers; a scientific journal, the *Zeitschrift für Gletscherkunde,* deals with them exclusively; and there is an international commission that has for years been studying and measuring glaciers all over the world. Glaciers are of two principal kinds. First, there are those that form in mountain valleys and creep down, like sluggish rivers, to the plains. Such are the glaciers of the Alps, the Himalaya, and our own western mountains. The other type of glacier takes the form of dome-like ice-sheets covering great tracts of land in the polar regions and spreading slowly outward from the center. One of these ice-sheets, or ice-caps, covers most of Greenland and another the Antarctic continent. In ages past vastly larger ice-sheets spread, during the cold glacial periods, far into what are now the temperate zones, leaving innumerable marks of their passage that still remain to tell their story.

Where the polar glaciers reach the sea fragments are detached from them, from time to time, and float away as icebergs. As about eight-ninths of an iceberg lies below the water, its drift is more influenced by ocean currents than by wind. The glaciers of Greenland, especially the west coast, give birth to most of the bergs found in the North Atlantic. Every spring a procession of them travels southward in the Labrador current, and many of these reach the Newfoundland Banks, where they are carried across the track of the transatlantic steamers. Fortunately for sailors, the region of the North Atlantic infested by icebergs, is relatively small and the season in which they are likely to be encountered by steamships is limited to about three months in the late spring and early summer. Thus it is possible for two cutters of the United States Coast Guard, making alternate cruises from the beginning of April to the end of June, to maintain the International Ice Patrol, which has practically eliminated the danger of icebergs in this part of the ocean. The patrol was started as a result of the loss of the *Titanic,* which sank after colliding with an iceberg in April, 1912.

PHOTO U. S. COAST GUARD

ICEBERG OFF THE STARBOARD BOW

Sighting the floating islands is a part of the work of the International Ice Patrol.

A majority of the icebergs found in the southern hemisphere are table-shaped masses detached from the great ice-cliffs, or "barriers," that fringe the Antarctic continent. Many are of such colossal size as to dwarf the biggest bergs of northern latitudes. Heights of from 800 to 1,000 feet are not uncommon, while the largest on record, sighted by the bark *Emil Julius* in 1884, towered about 1,700 feet above the sea. Several have been reported forty to fifty miles in length, and one seen in 1893 is said to have been eighty-two miles long. A vast island of ice encountered by a number of ships in 1855 had a bay forty miles wide on one side. Ships entered this *cul-de-sac* under the supposition that it was a passage between two separate bergs, and one was lost with all hands.

COPYRIGHT CAPT. FRANK HURLEY

THE WEEPING WILLOW

This bit of Elephant Island in the South Shetlands gets its name from its dripping icicles.

Besides icebergs, a great many distinct forms of ice are found floating on the sea or attached to shores, all of which have been given names by sailors and polar explorers. Thus there is the flat *field-ice,* which often makes great areas of the ocean unnavigable. An ice field is defined by a recent authority (J. M. Wordie) as "a sheet of ice of such extent that its limits cannot be seen from the masthead." Contrasted with this, we have *drift-ice,* which is defined as "loose open ice, where the area of water exceeds that of the ice." An area of ice whose limits are within sight is called a *floe.* Chunks somewhat smaller than icebergs are called *bergy bits.* Still smaller are the dangerous *growlers,* so called on account of the sound they make when rolling in the waves. *Pancake-ice* occurs in flat circular pieces with raised rims. *Brash* is a collection of very small pieces, through which a ship can easily force her way. There are many more terms in this picturesque vocabulary, which was originally formulated by the Arctic explorer William Scoresby, Junior, more than a century ago, and has undergone a number of modifications at the hands of later authorities.

When a body of water, such as a lake or a river, cools with the approach of winter, the chilled surface water at first settles down, on account of its increased density, and is replaced by warmer and less dense water from below. This interchange tends to make the temperature of the water uniform throughout its depth, and if it continued until the freezing point was reached the entire body of water would freeze solid at once. It ceases, however, when a temperature of 4° C. (39.2° F.) is reached, since water is densest at this temperature and expands with further cooling until it turns to ice. Thus it happens that ice ordinarily forms first at the surface, and last, if at all, at the bottom.

While this is the ordinary process, it has long been known that ice may form at the bottom when there is none at the surface, Such ice is found especially in running streams and is called *anchor-ice* or *ground-ice*. It occurs in spongy masses, quite unlike the glassy plates of surface ice. When detached it rises to the top of the water, often bringing with it heavy objects from the bottom, such as rocks or lost chains and anchors. Its formation was formerly a subject of much controversy, but is now explained by the fact that the substances on which it is deposited lose heat rapidly by radiation through the water above them, and thus cool the lower layers of water below the freezing point. The process takes place only at night and in clear weather and is similar to that by which, under the same conditions, hoar-frost is deposited upon objects in the open air.

Still another kind of ice found in running water is called by the French-Canadian name *frazil*. It consists of little icy particles that form at the surface but are prevented by the movement of the water from uniting in continuous sheets. In the St. Lawrence vast quantities are formed in the rapids and are carried under the surface ice farther downstream, sometimes damming the river and causing disastrous floods and "ice-shoves" along the banks.

The name *ground-ice*, besides being used as a synonym of *anchor-ice*, is applied to the large bodies of more or less clear ice found in the permanently frozen ground of high latitudes, as, for example. in the subsoil of the Siberian tundras. In allusion to its supposed antiquity, such ice is also called

NATIONAL PARK SERVICE

RIGHT

WINTHROP GLACIER, MOUNT RAINIER

Forty-five square miles are covered by the glaciers of this great mountain.

BELOW

ONCE BATTLE WRAPPED, NOW GRIPPED IN ICE

Chickamauga Park during an ice storm when glistening trees remind of myriad bayonets.

fossil ice. Even in the temperate zones there are places where subterranean deposits of ice are found through the whole or the greater part of the year. These occur in so-called *ice-caves* or *glacières,* scores of which are known in the United States and Europe, or sometimes in deep gorges, or among great piles of rocks, as in the case of the celebrated Ice Mountain near Northriver Mills, West Virginia. It is popularly believed that the ice found in ice-caves forms in summer and melts in winter, reversing the normal order of the seasons. What actually happens, at least in most cases, is that pockets of cold air gather in winter and remain because they have no outlet, while the ice is mainly formed from water that trickles down during the thaws of spring.

After a clear cold night, especially in the late autumn and early winter, the surface layer of a moist gravelly soil is often raised an inch or two by a mass of vertical columns or needles of ice. This ice is pushed up by the capillary action of soil moisture. A similar action of the moisture in plants sometimes leads to the formation on their stems of delicate ribbons or curled shells of ice, known as *ice-fringes.*

Hoarfrost does not usually conform to the schoolbook description of "frozen dew." As a rule

PHOTO DOMINION ASTRONOMICAL OBSERVATORY

RIGHT

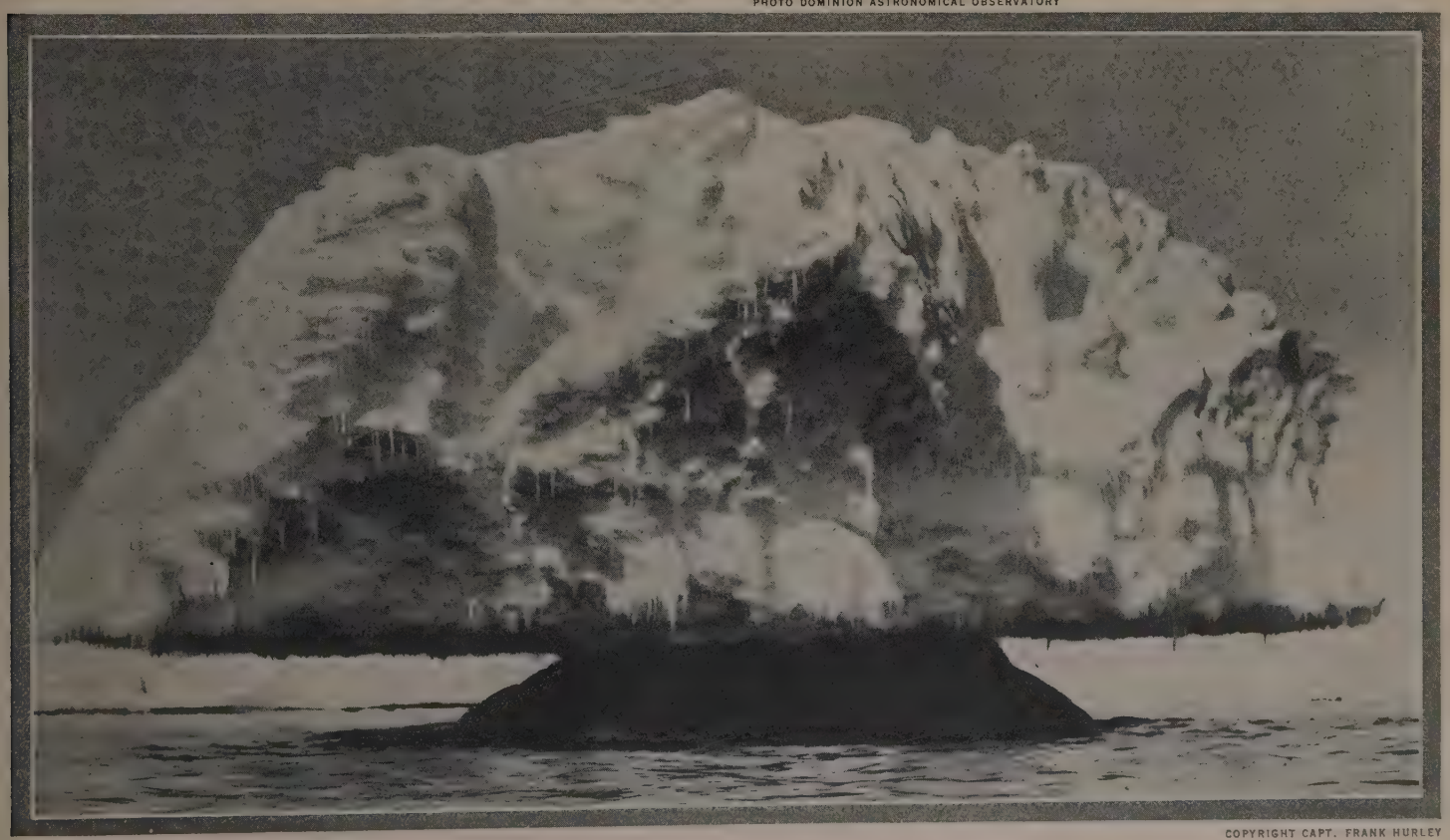
RIME DEPOSIT ON ROSE BUSH

Feathery ice deposited by fog, the droplets of which turn to ice on touching a solid object.

BELOW

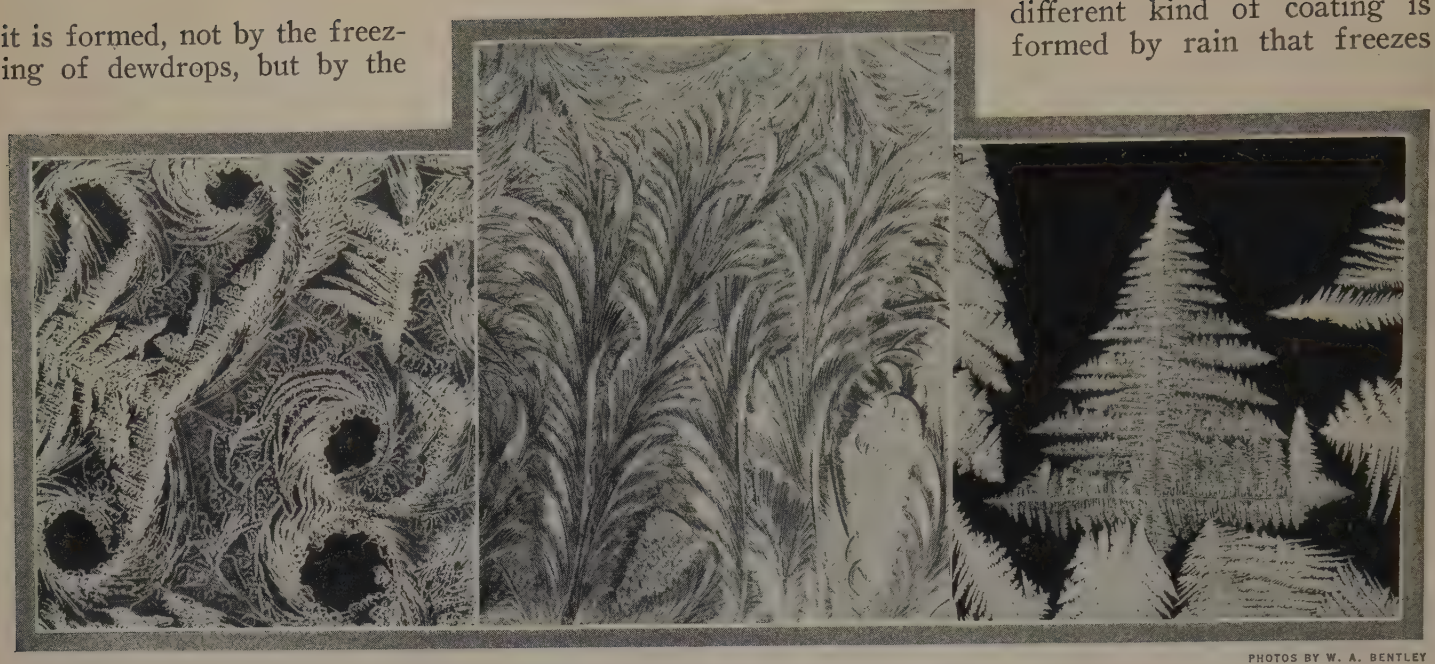
A STRANDED ICEBERG IN THE ANTARCTIC

A floating monster of the sea transformed into a chilly mushroom.



COPYRIGHT CAPT. FRANK HURLEY

it is formed, not by the freezing of dewdrops, but by the different kind of coating is formed by rain that freezes



PHOTOS BY W. A. BENTLEY

NATURE PAINTS WITH FINGERS COLD AND DEFT

The tree-like and spiral patterns are "window frost," while the feathery design in the center is formed by a freezing film of water.

condensation of the gaseous moisture of the atmosphere in an immense variety of crystal forms quite unlike spherical frozen drops. Hundreds of different shapes have been drawn and photographed. Hoarfrost occurs not only on outdoor objects, after a clear frosty night, but also indoors on windowpanes, refrigerating pipes and other cold surfaces. Not all the so-called frost figures seen on windowpanes, however, are due to hoarfrost. Many, including the long feathery or fern-like forms, result from the freezing of a thin film of water on the pane, and have sometimes been distinguished as *window-ice*. Some of the most beautiful deposits of true hoarfrost are found on the surface ice of lakes, streams and glaciers. They are known as *ice-flowers*.

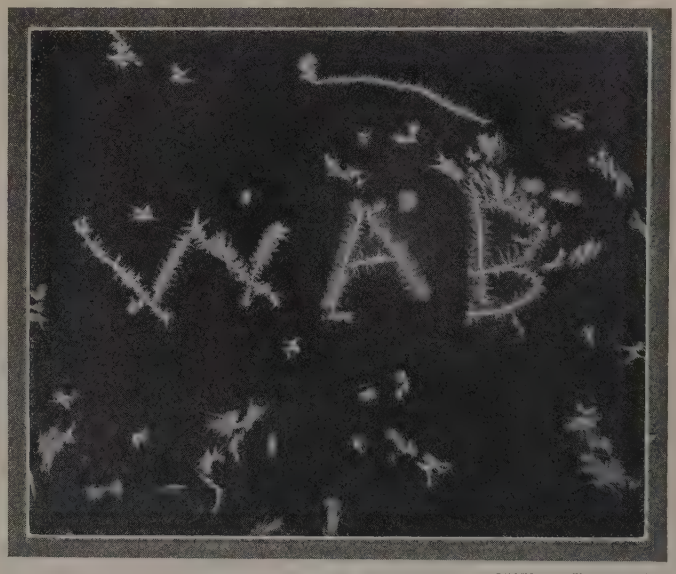


PHOTO BY W. A. BENTLEY

FROST MAN TRAINED

Several times each winter the frost forms new elaborations of the initials on the windowpane.

A rough or feathery coating of ice deposited on terrestrial objects by drifting fog in cold weather is technically called *rime* (a name applied in general literature to hoarfrost). The heaviest deposits are found on mountains and in the polar regions. A different kind of coating is formed by rain that freezes as it falls. This process encases trees, wires and other objects in smooth ice, known to American meteorologists as *glaze* and to the British as *glazed frost*. A heavy deposit constitutes an *ice storm*, and often does much damage. In the great New England ice storm of November 27–29, 1921, it was estimated that five tons of ice formed on a tree of average size, while the ice on wires was two inches thick. Long lines of telephone poles fell, in some cases a mile at a stretch, and forest trees lay prostrate in windrows.

In very cold weather the air is sometimes filled with glittering ice crystals. These do not obscure the daylight, but there are also denser fogs and mists of ice, such as the *frost-smoke* that rises from patches of open water in the midst of polar ice.

Snow, hail, sleet and graupel—all more or less important products of Nature's ice factory—have been described by the writer in earlier articles of the present series.

The Pitcher Plant of the North, South and West

By PROF. A. A. HANSEN

MOTHER NATURE has created many odd things, among the strangest of which are the insectivorous plants—plants that capture, kill and digest their animal prey. There are several hundred species included in the carnivorous flora of the world, among the commonest of which are the pitcher plants.

There are three outstanding species of pitcher plants in the United States, and the different species are well separated geographically. In the north we have the northern pitcher plant or huntsman's cap, *Sarracenia purpurea.* In the south the yellow pitcher plant or huntsman's horn, *Sarracenia flava,* predominates; while on the Pacific coast may be found the California pitcher plant, *Darlingtonia californica.*

Let us first examine the common northern species. It is a native plant that may be found in bogs in almost any section east of the Rocky Mountains, although common in northern bogs only. The flowers, which appear during late spring, are curious nodding blossoms, reddish or green in color, each with five petals. The most interesting feature, however, is afforded by the leaves, which occur clustered at the bases of the flower stems. Each leaf is pitcher shaped, due to the enlarging of the leaf stalk or petiole into a hollow structure with a keel running along the top. Each little pitcher is crowned with a flattened leaf blade, corresponding to the tongue or pouring surface of an ordinary pitcher. In their native haunts in sphagnum bogs, the pitchers are usually partly or completely filled with rain water.

The manner in which the pitcher plant entices and destroys its victims is one of the strangest chapters in the history of nature. The broad leaf blade at the top of the pitcher is decorated with numerous purple lines, all of which run in a downward direction toward the throat of the pitcher. The pathway into the throat is beset with hundreds of stiff little hairs, which, like the purple lines, point downward. Below the hairy region, just beyond the rim, is a smooth, slippery platform, while under the rim there is secreted a sweet liquid that is said to have intoxicating properties, although this point has not been satisfactorily demonstrated.

The stage is now set for the entrance of the unfortunate insect victim. It may be a clumsy beetle that crawls heavily over the smooth edge, attracted by the sweet secretion inside the rim. The foothold afforded by the slippery surface is very insecure, and the unwary visitor slides into the cold water from which there is no escape on account of the slippery inner wall of the pitcher. Or, perchance, a flying insect, attracted by the gay-colored lines, alights on the gaudy leaf blade. The lines and the downward-pointing hairs guide the victim toward the sweet secretion, where it pauses, perhaps, for a final meal that reminds one of the last grand feast of a condemned prisoner. Made sluggish by overindulgence in the sweet fluid, the insect attempts to crawl out, but exit is blocked by the formidable downward-pointing hairs. In maneuvering around for an

HUNGRY LOOKING CALIFORNIA PITCHER PLANTS

This plant has hoods with little windows through which the entrapped insects vainly try to escape.

easy way out, the chances are that the unsuspecting victim will crawl upon the slippery area, to fall into the death-dealing water below. The wetted wings prevent flight, and the victim perishes miserably. The body soon decomposes in the watery grave, and there is strong evidence that the plant is able to utilize the products of decomposition for its own growth and development. Cut open the urn-shaped leaf, and the basal portion will usually disclose a strange collection of legs, beetle shells, wings and other undecomposed portions of numerous unfortunate insects.

NORTHERN PITCHER PLANT IN FULL FLOWER
Note the basal cluster of pitcher-shaped leaves into which insects venture never to escape.

The southern species, the yellow pitcher plant, is more stately in appearance than its northern relative, but none the less deadly. The trumpet-shaped tapering leaves are tall, erect and more graceful in outline, while the yellow flowers are frequently much larger than are the reddish blossoms of the northern species. In common with most of the pitcher plants, it is an inhabitant of bogs and moist soil. The shape of the leaves is responsible for the common name, trumpet leaf, frequently applied to this plant. It lends itself readily to cultivation, being unlike the northern plant in this respect, and it is frequently grown in greenhouses as a curiosity. The southern pitcher plant is as treacherous as its northern cousin. It lures insects by both vivid colors and sweet secretions, and the unwary victims slide from the steep, slippery walls into the water that fills the base of each of the slender pitchers. The expanded leaf blade at the top of the pitcher acts as a protecting hood to keep out an excess of rain and to prevent evaporation.

FLOWERS OF NORTHERN PITCHER PLANT
The leaves at the bases of the stems are the ensnaring pitchers.

The California species is perhaps the most curious of all the pitcher plants. The top of the pitcher forms a hood, and the only entrance is afforded by means of two fan-like flanges. Enticed by the sweet juices, insects enter the hood, which is so constructed that the entrance is darkened, while opposite are thin spots in the wall that resemble tiny windows. Attracted by the light, the victims rarely attempt to find their way out by way of the darkened entrance, but, instead, devote their efforts toward the window-like region. Exhausted by their struggle, they seek rest on the side walls, which are covered with downward-pointing hairs. All attempts to crawl bring the insect nearer the liquid at the base that is destined to be its grave. Strange to relate, a certain moth has learned to utilize the interior of the handsome pitcher as a home. The moth is a star boarder—it secures protection and food without paying for the privilege.

A number of varieties of pitcher plants are cultivated in greenhouses, conspicuous among which is the red pitcher plant, an attractive red-flowered species that may occasionally be found wild in southern bogs.

Then there is the parrot pitcher plant with its short, spreading leaves and white-spotted, globular hoods. Another greenhouse form, the *Nepenthes*, is representative of the most dangerous of carnivorous plants. The pitchers hang from the tips of the leaves, and they secrete digestive juices that are said to be similar in chemical composition to the digestive fluids of the human stomach.

A number of species of *Nepenthes* grow wild in Asia and Africa, and in some of them the pitchers attain such great size that birds and small reptiles are occasionally captured, drowned and digested. The *Nepenthes* pitchers may be aptly compared to the stomachs of the higher animals, since they not only secrete digestive juices but also possess spherical, gland-like structures that apparently absorb the products of digestion. Not only that, but tissues especially designed to carry the digested food away may be found below the glands. As in the case of the northern pitcher plant, the stomach-like pitchers of *Nephenthes* secrete a sweet liquid that acts as a bait to attract victims.

THE RED PITCHER PLANT

This is a greenhouse favorite but only occasionally found wild in southern bogs.

WOE TO THE INSECT ENTERING THESE

On the right note the downward pointing hairs barring escape from this northern pitcher plant's embrace.

What is the reason for the development of the carnivorous habit among plants? The answer is one of the mysteries that science has been unable satisfactorily to fathom. One view holds that plants growing in bogs, which is the usual habitat of the carnivorous flora, do not receive a sufficient supply of nitrogen from the soil, and in order to make up the deficiency these curious plants have evolved the carnivorous habitat in order that the nitrogen from the decomposing captured insects may be utilized. This is probably the best theory available, but it fails to explain why other bog plants, such as cassandra and sphagnum, are able to get along nicely without animal nitrogen.

There is another theory that the early ancestors of the insectivorous plants possessed glandular hairs to protect their pollen and nectar against the ravages of such robber insects as the ants, insects that steal pollen and nectar without paying for their food by performing the service of pollination. A number of modern species, as the wild pink and the catch-fly, possess such glandular hairs in abundance. It is possible that the stimulus provided by the captured insects gradually lead to the development of special structures for the utilization of the rich store of nitrogen in the bodies of the decomposing prey. We must admit, however, that the various theories do not explain the flesh-eating

habits in a very satisfactory manner. The fact that pitcher plants inhabit bogs and other situations not readily accessible has been a strong factor in preserving them against extinction by the hands of thoughtless collectors, who seek them because they are such great natural curiosities. But even the bogs do not always serve to protect them, a fact that was called to my attention in a striking manner a few years ago. In central Pennsylvania there is a huge bog called Bear Meadows, a spot with a flora of such unusual richness that it has been a Mecca for many American and European botanists. About forty years ago parts of the Meadows were literally carpeted with pitcher plants growing in company with the sparkling little sundew, another insectivorous species. I have tramped the Meadows many times during recent years and have found but a few small colonies of pitcher plants, since large numbers have been destroyed by lumbering operations and by collectors. Some time ago a specimen of the northern pitcher plant was exhibited in a window in a nearby college town, and the interest thus aroused caused a sudden rush to Bear Meadows by student collectors. The threatened total extinction of the pitcher plant in the region was prevented only by strenuous efforts on the part of the local chapter of the Wild Flower Preservation Society.

The carnivorous plants are certainly among the most curious of nature's many odd creations. We cannot help but wonder at this strange whim of nature that lead to the sacrifice of animal life to sustain plant life.

The long-leaved sundew, frequent bog companion of pitcher plants.

NEPENTHES, NEMESIS OF INSECTS

The pitcher plant of Africa and Asia with pitchers dangling from leaf tips.

AN ILL-FATED FLY

A round-leaved sundew about to have an insect for dinner.

Points About Porcupines

By ERNEST HAROLD BAYNES

Author of "Polaris," "Jimmie," "The Sprite—The Story of a Red Fox," etc.

(COPYRIGHT BY ERNEST HAROLD BAYNES)

BROADSIDE VIEW OF PORKY

Hair and quills erect, he is very much on the defensive.

ONE NIGHT last week I was tramping homeward over a mountain road in the moonlight when I heard a sound which brought me to a halt. It was a peculiar growl such as wild boars sometimes make when they are watching you from ambush—a hint which a man should take just as soon as convenient, especially if he is unarmed. A moment later, however, I knew it was not a wild boar to which I was listening. The sound occurred too frequently and the intervals were too regular; it was made by a porcupine gnawing seasoned wood. Close by the road was a clearing, and there, screened by ancient lilac bushes, a deserted wooden house leaned upon its tottering chimney. The porcupine was evidently inside, and no doubt it was partly due to the echo of an empty room that the rasping of his teeth resembled the grumbling of a boar.

Very softly I stepped across the grass of the old dooryard and, cautiously rounding the corner of the building, suddenly I peered through a gaping doorway on to the moonlit floor. At least it had been a floor, but there was very little of it left except the beams, and on one of these sat a large black porcupine, caught in the act, and looking very much astonished at the shadowy apparition which had interrupted his work of harmless destruction. He had raised himself to a sitting posture, and I could catch the gleam of the beady eye that was turned towards me. He was frightened, too, for his teeth were chattering. Slowly and clumsily he turned, more rapidly he passed through a gaping hole in the floor, and I could hear the scraping of his big claws as he scrambled down a post into the cellar.

Next day, when I returned to examine what was left of the floor of the room, I found that almost the whole of it had been chiselled away by the incisor teeth of porcupines. There were four other rooms in the house, but the floors of these had not been gnawed. The cause of such partiality was not hard to find and was centered in the fact that porcupines are very fond of salt. The house was perhaps a hundred years old, and the room with the mutilated floor had been the kitchen. For more than a hundred years, salt pork had been fried in that room, and almost every day, sometimes three times a day, the salty grease had sizzled and spattered or been spilled on the bare floor until the boards had become saturated with salt.

First and last I have received many points from porcupines, but most of them came from two specimens which were sent to me from Maine when I was a small boy. I went to the station to meet them, and there they were in a wooden box which the sender had lined with sheet iron to prevent them from cutting their way to liberty. When I got them home I put them into an empty hen-house which was to serve as temporary quarters until a pen could be made for them. It was six o'clock and supper time, so I left them in a hurry, intending to go back and feed them after supper. But there was company that evening, and the attractions were so strong that it was after nine o'clock when I went out to see the porcupines. I entered the little building, lighted a candle end and looked around. My guests had gone. On one side of the hen-house there was a window, and I could see that the woodwork had been gnawed until much of the glass was loose. One pane had been knocked out, and through the gap the animals had departed.

Putting out my candle I peered through the open door, but it was too dark to see anything but the sky. I returned to the house for a lantern, but I could not find it (a borrowing neighbor had failed to return it). There was a strong wind blowing, but by putting a lighted lamp inside a paper bag, I made a clumsy but usable lantern and went out to look for the lost porcupines. The light was very

RIGHT

AN UNCOMPROMISING, INHOSPITABLE BACK

Porky's tail is the last part of his anatomy to take liberties with.

BELOW

A FUZZY SILHOUETTE

He may look soft at a distance but he has a surprising defense.

feeble, and I could see only a short distance. First I searched our own poultry yard, which was surrounded by wire netting. They were not there. Then I made a more extended exploration in the fields outside. One of these was a pasture overgrown with shrubs, and through these I made my way, tripping over hidden rocks and sometimes losing my cap among the branches overhead. Now and then a sudden gust would carry away my paper bag, blowing out the light at the same time. Of course it was necessary to relight the lamp before I could proceed, and in the wind this was not an easy job. I was walking more or less at random, for I had no idea what direction the fugitives had taken. But I was persistent if nothing else, and after hunting for about an hour, I suddenly came upon one of the spiny little beasts, sitting in the crotch of a large white birch, calmly eating the bark. As he showed no desire to run away I decided to watch him for a while, so I held up my lamp and waited. He had paused when I came close to him, but in a minute or two he began to eat again. With his large yellow incisor teeth, he quickly ripped away the dry papery outer covering and then scraped off the juicy inner bark, which he chewed and swallowed with apparent relish, meanwhile watching me with his rueful black eyes.

But it was getting late and I still had another porcupine to find, so it behooved me to capture the one I had found. I approached him confidently with the intention of picking him up and carrying him back to the hen-house. But I knew even less about porcupines then than I do now. In fact this was the very first one with which I was to become personally acquainted, and he taught me more natural history in a few minutes than I ever learned from a college professor in twice the time. I put out my hand to take hold of him, but, presto, there was nothing that looked particularly easy to take hold of. He had wheeled around, and at the same time raised all the hair on his back, displaying a formidable array of sharp quills that looked anything but inviting. I moved around in front of him. At least his front was there when I started. But he had wheeled again, and there was his uncompromising, inhospitable back, just about

as inviting as the under side of a harrow. But then I observed his tail. Ha! ha! now we would see. It hung down so innocently and all the quills upon it lay flat and pointed toward the tip. Here, then, was the one vulnerable point on which I could safely make an attack. I hastened to take hold of it and learned at once that a porcupine's tail is the last part of his anatomy one should take liberties with. It is the one member which cannot fairly be accused of slowness. The instant I touched it, it sprang upward as if propelled by a powerful spring, and my hand felt as if it had been stung by forty hornets at once. I had gloves on, but the quills went through and into my flesh. It took some time to remove those quills, and the operation was not exactly pleasant. I found that the easiest way was to jerk them out one by one. I had heard that the tips of porcupines' quills are barbed, and now I learned that this was true. So each one literally sawed its way out and was followed by a tiny stream of blood as the result of the wound it made.

Next I tried to grasp a hind leg, but I found that a porky's tail works sidewise as well as upward, and again I received more than I had asked for. At last I held down the offensive member with a stick, and, grasping it firmly with one hand, loosed his claws from the bark with the other. Then, picking up my lamp, I made my slow and painful way to the hen-house, the outraged porcupine clutching at every twig and tree stump in our path. He was quite heavy, and twice I had to set him down and both times he got away from me. But at last I had him safe and went off in search of his companion.

A PAINFUL ENCOUNTER

Some dogs, peppered with Porky's quills, will work them into the mouth.

After examining the surrounding country about a foot at a time, it seemed for another hour, I happened to look over a wall into a neighbor's wood. There stood my spiny friend, his head bowed between his forepaws, and with every quill on end, like a mailed knight at prayer. I climbed the fence, but before I could attempt his capture he shuffled off at his fastest gait, and I followed as best I could. His pace was not a hot one, but it was fast enough for me, handicapped as I was with the lamp. I was most anxious to keep him in sight, for if I lost him again my long search must begin anew. So I hurried along, now bumping into trees, now stumbling over rocks in the uncertain light, and scratching myself on more blackberry bushes than I had supposed could grow in one county. But I never

HE CARRIES QUILLS ON HIS HEAD, TOO

The forward part of the porcupine offers no more an inviting handful than his after part.

lost sight of the shadowy form, and after a stern chase of perhaps a quarter of a mile, I saw my quarry run under our neighbor's hen-house, the floor of which was raised two or three feet from the ground. Under this I dived, lamp in hand, hoping that my adventures were about at an end. The hen-house was a large one, and the fugitive had plenty of room in which to maneuver, and it was some time before I brought him to bay in a corner with his head to a post. In trying to take hold of him I was more cautious than I had been with the other porky, and at each attempt he uttered such pathetic whines that it was hard for me to hold to my purpose.

PORKY IS A CLIMBER OF ABILITY

He goes up slowly but surely and munches bark en route. (Insert) Porky headed for the upper branches.

Just then there arose a serious complication. Between us we had disturbed the hens which were roosting in the building above our heads, and they began to squawk in chorus. A moment later a pistol cracked in the direction of our neighbor's house and, peeping round the corner, I saw the flash of another shot, which came from an upper window. This was getting serious, for evidently our operations had aroused the neighbors and they had jumped at the conclusion that chicken thieves were at work. So I hastened to explain before it was too late.

"Mr. Jones!" I shouted, "it's I, Mr. Jones! My porcupine has gone under your hen-house and I'm trying to get him out."

Mr. Jones was a deacon of our church, and I'm sure if he were living he would not wish me to repeat what he said about porcupines and juvenile naturalists, which he bracketed together in a most uncomplimentary way. Then a window went down with a bang and I was left to continue my absorbing occupation without further interruption.

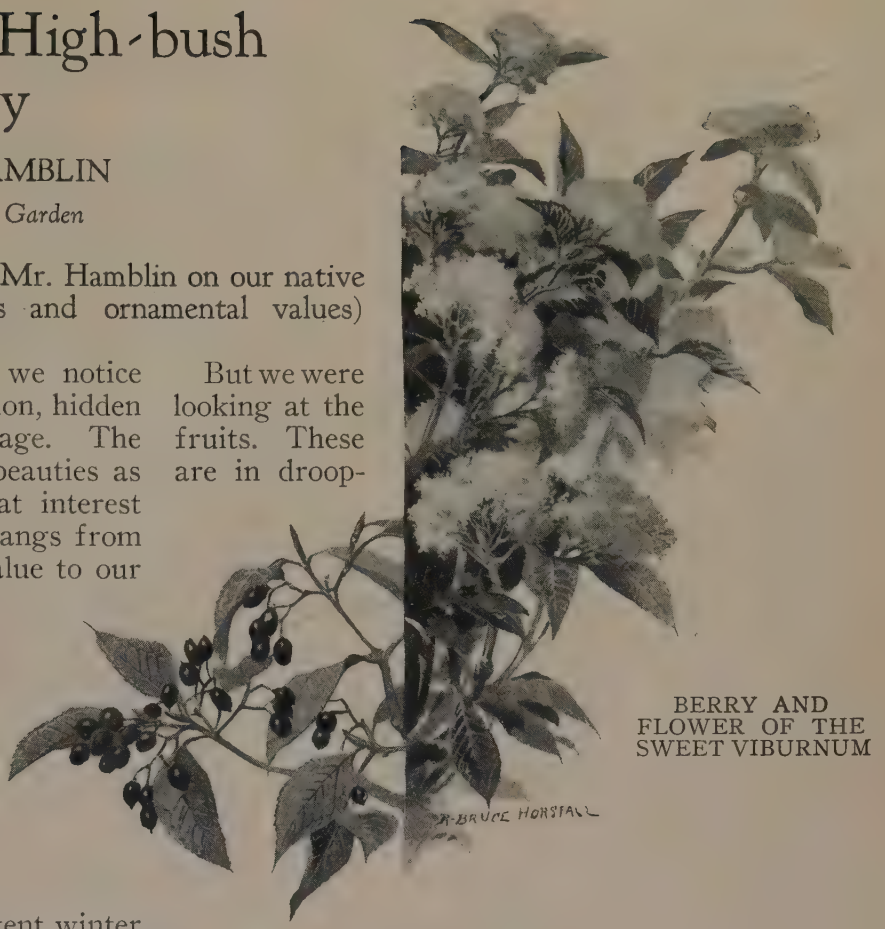
But by this time I was getting a little out of patience. I was very tired, I had bruised and scratched myself until I was sore all over, I had annoyed our nearest neighbors, and, worst of all, I hadn't caught my porcupine. My gloves, covered with quills, I had lost in my race through the woods, but I snatched the cap from my head and, setting down the lamp, I crawled to the attack. The porky was waiting for me, but I was in no humor to be trifled with. I was prepared for a handful of quills and I got it and said nothing. But I caught the enemy's tail "on the fly" so to speak, and hanging on to it, I dragged out my prisoner a foot at a time. How those spines did hurt, but it was "now or never," and I trudged back to our hen-house in silent agony. After barricading the window with wooden boxes filled with stones, I tugged those quills from my flesh, washed my wounded hands and went to bed with a respect for porcupines which has lasted until now.

Nannyberry and High-bush Cranberry

By STEPHEN F. HAMBLIN
Director, Harvard Botanic Garden

(This is the first of a series of articles by Mr. Hamblin on our native shrubs, emphasizing their characteristics and ornamental values)

AS SNOWS descend upon the fields we notice more the details of the lower vegetation, hidden entirely by the canopy of summer foliage. The bushes along the roadside take on new beauties as the leafage colors and falls. One great interest of the roadside shrubs is the fruit that hangs from the twigs and the thought of its food value to our winter birds. Strangely, most of the berry-bearing shrubs useful for bird food in their fruit in winter are not native, but were brought from Europe or the Orient, where winter fruiting seems more common than in our American fields. The berries that we eat and the fruits of early autumn that load down our native shrubs are nearly all stripped away by the first heavy frosts.



BERRY AND FLOWER OF THE SWEET VIBURNUM

One great group of shrubs with persistent winter berries is the genus Viburnum, and no section of the world is so well supplied with them as the eastern half of North America. The botanists have had a merry time making species of them, and deciding how many are this type and how many are something else. Many of the kinds drop their berries in early autumn, but two groups, Nannyberry and High-bush Cranberry, hold their fruit with the best of them until after the new leaves of next spring.

The original Nannyberry (*Viburnum lentago*) or Wild Raisin, Sheepberry, etc., is a true American type. It is common along country roads and edges of woods from Hudson Bay to Mississippi. It is a large shrub, quite tree-like (often 20 feet tall) with something the look of a small old pear tree. The leaves are quite like those of a small-leaved pear, but in pairs (opposite), and unlike the foliage of any other American tree or shrub the leaf stem (petiole) has wavy fleshy green wings, making it quite unlike any sister Viburnum. The flowers are tiny, white, in flat clusters, a good example of a cyme, in late May, like a small edition of a cluster of pear blossoms, and with slight odor to attract flies. The flowers of most Viburnums are very similar to one another, and their cluster is very like that of the group Cornus, the Dogwoods, but Viburnum has five petals and Cornus four to the flower.

But we were looking at the fruits. These are in drooping clusters, dull blue-black, shaped like a tiny oblong plum, or a date, with an oblong stone inside. The larger birds eat them, and the Indians considered them a useful winter fruit. They are decidedly edible, especially as a relish in the middle of a winter's hike, with a flavor quite like raisins, or the humble but wholesome prune. When cooked, except for the smaller stone, they quite resemble the favored (not favorite) morning-cooked fruit of the boarding-house table, for it is rich in sugar and iron. This is a strictly American fruit whose story is told in the words, "It might have been." Had raisin and prune not been brought over by our forefathers, our plant breeders could have taken this shrub and improved the size and flavor of the fruit, perhaps to outrank the prune. The bush will grow in any soil from Hudson Bay to the Gulf, and, best of all, the plums can be gathered any day from October to March, being not harmed at all by frost, and curing and drying themselves on the tree.

The Nannyberry is much planted in our parks and larger gardens. It is useful in screens, high shrub masses and along driveways, but its most effective place is at the edge of woods or in front of other tall shrubbery, or as a specimen, where its charactertistic habit of growth can best be displayed.

The Black Haw (*V. prunifolium*) is a very similar shrub, found in much the same part of the country, ranging west to Texas. When I was learning our bushes I could see little difference from Nannyberry. But it is a more twiggy bushy shrub (to 15 feet) at a distance quite like a rounded bushy Hawthorn. The leaves are opposite, very like Nannyberry, but more rounded, and the petiole is but faintly winged. The flowers come earlier (early May), the earliest Viburnum of this group to flower, decidedly yellow-white in color, with an offcolor odor that pleases bugs and flies. The clusters of many flowers turn into small clusters of fruits, which usually stand up while Nannyberry hangs down, the little plum smaller, of a deep blue color, not so juicy or well flavored. The larger birds make no distinction, but for personal food I prefer Nannyberry.

The Black Haw is planted much as the Nannyberry, but as it requires more space for its greater horizontal development it is not as common in small gardens. It is one of our most striking shrubs when placed as a specimen for accent or to display its level lines in the composition of a lawn picture.

U. S. DEPT. OF AGRICULTURE

FRUIT OF THE AMERICAN VIBURNUM

The clusters may be large or small, loose or compact, erect or drooping with the berries dark red or yellow banded.

The more southern sister of this group is the Southern Black Haw (*V. rufidulum*) which is like and yet unlike to both. It ranges from Virginia to Texas. It is a big stout shrub, very horizontal or irregular in its habit, more like Black Haw, but the twigs and buds are covered with a red-brown wool. The leaves, flowers and fruits are much as Black Haw, but it flowers a month later. The flattened brown woolly bud at the end of the twig in winter is especially striking.

U. S. DEPT. OF AGRICULTURE

FLOWERS OF THE HIGH-BUSH CRANBERRY

Other species of Viburnum have long been used as ornaments, but the American is now gaining favor.

This shrub is too little known, and rarely seen except in special plantings. Few nurserymen carry it, and possibly it lacks the grace of the more compact and regular outline of the Black Haw.

One red-fruited Viburnum (*V. americanum*), the fruits of which persist all winter, is an uncommon companion in the fields of the blue Nan-

nyberries, though now quite commonly planted. It is called High-bush Cranberry because the acid red fruits taste quite like the cranberry, especially frozen ones eaten in midwinter. It has long been confused with the similar European species (*V. opulus*) seen in our gardens, but the two are quite different in fruit. The European fruit has a bitter flavor, a disagreeable musky odor, and gets faded and soft before spring. The berries on our own bush are quite edible, though flavor varies on different plants, sharply acid, firm, odorless, dark red, and remaining firm and shining until spring. It is probable that this fruit will be developed for home use like currant and cranberry. Its natural range is northern, from British Columbia and the northern states to New Jersey. It is essentially a cold climate fruit, but will grow anywhere that frost touches it.

The shrub is different from our other Viburnums. The large leaves are 3-lobed like a maple, but with swollen glands on the petiole. The big flat clusters of flowers (May) have the same row of showy sterile hydrangea-like blossoms on the outside as has the European species. The "double" snowball cluster is on the European plant, and no such form of our plant is yet known. The glory of our bush is in its firm shining red fruits, and by trick of fate only recently has their usefulness for winter color or jam been appreciated.

Nurserymen are beginning to appreciate the difference between the American and European High-bush Cranberries, and our species is considered superior for its winter fruits. At other times in the year there is little difference, though our species usually colors red in the autumn and drops its leaves earlier than does the introduced plant. Both are useful tall shrubs where a high planting is desired, but most of the plants now seen are foreign species.

The Broken Timber, Forerunner of Disaster

WEIGHTED from above with the task of supporting uncounted tons of coal and earth, this mine upright has given way. A few such and the disaster of cave-in will come, cutting off miners at their work and choking the corridor against escape. This post was sound when it was put in. Decay set in and weakening fungi did their rapid work. Within a year the upright creaked, tore and bulged outward. Beside it stands a post put in at the same time but prepared for its task with a preservative. After a year it is sound and untouched by decay. In the foreground are two other timbers, untreated and showing the effect of fungus attack. Making wood do its full service by protecting it after it is felled is one of the vital steps in solving the problem of forest conservation.

BOB AT THE SIX-MONTH MARK

His name came from the short, stubby tail he carried aft. He had not then taken on the angular look of a full-grown wildcat.

Tom and Bob

By WILLIAM L. AND IRENE FINLEY
Of the National Association of Audubon Societies

(PHOTOGRAPHS BY THE AUTHORS)

WE STOOD near the front porch talking to some visitors, while against our legs two large cats purred and rubbed themselves. They were friendly, intimate cats, with long legs, stubby tails, tufted ears and silky hair that hung from their chops like side-whiskers. In fact, they were bizarre sort of felines, you see.

One of our visitors stooped in the usual absent-minded way to stroke one of the cats. With a sudden spring the cat that was being neglected landed squarely on the inviting shelf of coated back. There was a unanimous squeal from the ladies and a bewildered plea of what to do from the man, bent like Atlas with a playful cat instead of the world upon his shoulders. Keen for the game his brother had invented, the second cat leaped for the playground, crowding for standing room. Then they both sprung lightly away.

"Don't let a pair of bobcats bother you," we laughed, and the truth was out. Bobcats they were, and there is no doubt that our visitors got more enjoyment out of seeing the cats try the back-riding stunt on a neighbor's dog—who departed post haste, fed up with the feline world for many moons—than they did out of playing the bobcats' game of leapfrog themselves.

The bobcat, wild cat or lynx that hunts every forest from the Atlantic to the Pacific is not the ancestor of the domestic tabby, household pet in all parts of the country. The kitty that likes to take a nap in your lap comes down from a long line since early Egyptian times. Domestication has wrought a wide range in color and looks, but still the gap is not wide between the house cat and the bobcat. Everyone knows how quickly the tame tabby will revert to the wild if uncared for, regardless of his centuries of gentling, but we are hardly prepared to understand a tame bobcat when we think of his generations of hunting and man's eternal enmity. Tom and Bob were blood children of the desert. Helpless and blind, when two days old, they were taken from a cave in the rocks at the edge of the sand and sage. They were given to a Persian mother who had one kitten of her own and had adopted two others. Still the mother love burned strong in her and she gladly accepted Tom and Bob. If she was skeptical as to the outcome of her mixed brood, she did not show it. The two baby bobcats missed nothing either of affection or food. They cuddled close to a warm, furry breast. Little did they know the difference between a cave in the rocks and a box in a garage. Milk was milk to them, whether from a mother tame or wild. The question was, what would environment make of them? Would it overcome the deep-seated wild instincts?

PERSIAN MOTHER TO A MIXED FAMILY
She reared the three kittens and two bobs with success.

The logy days of infancy passed, interrupted only by nestling and nuzzling and lapsing back into the comforts of sleep. The two bobcat kittens and the three domestic kittens were surprisingly different in looks. The ears of the bobs were creased carefully and bent over flat against their heads as if pressed down by an iron. Their

tails were short and stubby in comparison to the longer, slim ones of the other kittens. Their short, stubby legs and big feet made a surprising difference, and their little bodies were beautifully patterned with brown and white spots.

A week or so after the eyes of this various assortment of kittens opened, it was plain to see that the tame brothers and sisters were growing more alert and nimble. They could climb out of the box and began following the mother about, taking more

BOB A YEAR OLD

He had taken on the look of the wild and was always on the lookout for birds.

than their share of dinners, while the sleepy bobs were all unconscious of it. At this time some care had to be taken to see that the little wildcats had a fair share of the milk that was coming to them, for the mother's supply was limited. Then a pan of milk was set out and the tame kittens soon learned to help themselves, giving the mother a little more chance to nurse the baby bobs.

The bobcat kittens were lumbering, helpless things, unsteady on their legs. Even after their eyes were open, their vision was blurred, for a white

A WILDCAT BABY

Clad in silky hair, equipped with long legs and tufted ears.

film showed as if they were blind. When they did begin to crawl around and get out of the box, they went pell-mell through a pan of milk. They seemed to recognize an odor of something good to eat, but they couldn't find it. They bumped into boxes and posts, or, coming to a stop, they landed in a heap. No vigilant, fiery wildness was yet showing in these bleary-eyed, blundering babies. It looked as if the bobcat race might be addled by suckling from a tame mother.

Before long it was plain that the wild children, so slow and awkward, were beginning to wake up. They called for dinner oftener and they took the Persian mother by storm. The tame kittens were weaned about this time, and the mother couldn't quite account for the difference in her children. Three were gentle; two were rough with whirlwind dispositions. Mother-like, she endured. The baby

DREAMING BOBCAT DREAMS

They were bleary-eyed, blundering babies, these bobs

bobs were about two months old before they were really weaned, but finally they came to realize that a pan of milk was not a swimming tank.

By this time all five kittens romped and played together. Three were more active and quickly learned to dodge the onrush of their half-brothers of the wild. Pick up a tame kitten and he showed a fondness for being petted. He submitted readily to restraint. The other two were restless. Just a moment of petting and they were fired with the idea to go. Try to curb them and they became irritated, and then quickly worked into a frenzy.

It was a piece of fresh meat that made a lightning change in Tom and Bob. Their eyes flashed a greenish hue. Instead of a quiet home in the back yard, they were in the cave of their birth on the border of the sand and sage where the mother brought them rabbits and grouse. The flood of ancestral memories surged over them. With twitching tails and itching claws, they crouched, ready to spring. Life itself depended upon their ability to launch an attack that would prevent anybody from snatching away their meat. A few moments later, the meat gone, the demon spirit went with it. They were again in a tame, playful mood.

And what of the little house cats that had lived for generations with man? Did they put aside all the rampant traits of their wild ancestors and become satisfied creatures of a milk-fed life? One day the yellow mother brought in a bird. It fell to the lot of her own gentle kitten. What a change! What a fiery little fury he became, clutching his game tight, growling and clawing to ward off any aggressor! The two bobcats, as well as the others, respected his right of possession, though their mouths must have watered at the smell of this choice morsel. Little the kitten left of his bit of wild meat. He still had the true killer's taste for blood and enjoyed it to the full.

Although this showed the true nature of the tame pussies, yet they did not stalk and devour the young chickens that escaped their coops and wandered near the kittens' playground. They were steadied by the influence of the Persian mother who had been reared among chickens and had learned that they had rights of immunity around the home. Not so with the bobs. Anything that moved and had feathers was game, and the baby chickens or turkeys were choice morsels not to be overlooked. How could they be expected to know otherwise? Their own parents were wild hunters from back near the beginning of time. Their foster mother

INSEPARABLE BUT ROUGH PLAYMATES

Bob was bold and came first to be petted, while Tom's instinct was to seek the safety of bush or tree limb.

was a hunter who made a nice distinction between young chickens and the songsters that nested in the nearby apple trees. The wrens and swallows were legitimate prey to her. One day she deliberately climbed a tree and, reaching her paw into a bird house, clawed out the helpless fledglings and carried them proudly down to her kittens.

Then one day Tom and Bob were left alone. The mother and three tame kittens were taken away. There was a surprise in store for anyone within hearing. Heretofore, the bobs had been silent, almost voiceless. When they realized they were deserted, they set up a wail, an unearthly, despairing cry. They stood in a panic and cried for their lost mother. They felt an emptiness that was wider than that of their stomachs.

JUST AFTER THEIR EYES WERE OPEN

Tom and Bob take a look at the world but their ears are not yet straightened up to listen.

As the days passed, the bobs adapted themselves to new conditions. There was plenty of food, warm cow's milk which they liked, with fresh eggs beaten into it, and occasionally a pan of chopped, cooked meat. They were coming into their own, the strong, bold vigor of the wild animal. The change had come very gradually, that tide which, slow to turn, ebbs to the crest of its power unhindered. Could it be tempered by taming? Could it it be directed into channels of reason and friendship? Or, were these bobcats after all to be true to the mother that bore them in the rocky cave, the hunters and the hunted?

The big-footed, knock-kneed cats ambled leisurely about the yard on soft, padded feet. One stole into a bed of ferns at the foot of the old apple tree. It was a signal for his brother to stalk him. Flattening to the earth, his head stretched low, his eyes glowing green, he slipped behind into the ferns. The pursuer was aware of the game. Up the tree he went in a wild scramble. Up flashed the other after him. Recklessly along the limb they streaked, to drop with a thud to the one below, and then plunge headlong out of the tree and run madly for the back yard, bumping their heads under the garden gate. No tame kittens these. Their bodies were of steel

BOB GREW UP WITH PETER, THE DOG

Neighboring canines, however, found him too rough a playmate for comfort.

(CONTINUED ON PAGE 63)

By BEN HUR LAMPMAN

This story of Swift, the Steelhead Trout, will introduce to the readers of NATURE MAGAZINE *a new contributor who wields a pen that interprets the wild as few can do*

. . . His bliss is older than the sun,
Silent and straight the waters run,
The lights, the cries, the willows dim,
And the dark tide are one with him.
—RUPERT BROOKE.

LIFE stirred beneath the mottled gravel of the river bed, causing the smaller particles to tremble and tinkle and roll in the cool green water, where the smooth current raced tirelessly. A coverlet of multicolored pebbles was feebly agitated in the bowl-like depression just above the break of the riffle. From their secret nursery scores of infant fish were wriggling toward the light. They burst and scattered the prison—a few, a multiple, then many, clinging to the bottom in a dazed revelation of birth.

The world they entered was of emerald shade and shimmer, roofed with silver and oriented by great and lesser rocks. Midway of the hastening stream lifted the bulky base of a granite monolith, gray and ancient save where elemental mosses daubed its flanks with the hue of April. There the flow was deeper, more riotous and wreathed in foam that shivered the smooth perfection. There, too, poised danger, vigilant. Shoreward the river grew placable, its bed lifting gradually into laughing shallows and thence to the straggling dark line that was its verge. The water flattened and idled over sand and sediment, fraught with warmth and safety.

To the infants of the river all this was ordered and understood. Hovering in the rush, yet spared the full sweep of the current by their natal concavity, they formed a dark and indecisive company — each frail, translucent form headed into the stride of the stream. Fear oppressed them, to the last born, yet with it came a rising joyousness, a sense of unsuspected and elate adventure. Shoreward were sanctuary and appeasement of hunger and promised delights.

'A questing squawfish drove his open maw through the flight."

Yet for all this certainty,

this impelling blend of dread and desire, they would have lingered irresolutely in their birthplace had not a sudden shadow danced across the gravel. As it fell, to shatter grotesquely, the school shuddered and scattered and darted on untried fins toward the haven. With a gleam of orange belly and in the turmoil of his strike, a questing squawfish drove his open maw through the flight—to strike again, now here, now there, in swift voracity before he swerved to his station by the monolith. Slowly the tireless river brought, bit by bit, those gravel grains that leveled the bowl where Swift was born.

His fellows, at chase and disport through the sunny shallows, christened him Swift, after the manner of fishes—with a flirt of fin and flip of the tail. They were a depleted fraternity, for some had come to scath in the race for sanctuary, and some the river had borne away to other refuge. In all not more than twenty tiny fry hunted at the verge of the stream athwart the gray rock. But of these, when the gnat foundered or some speck of marine life drifted by, none was so instant and assured as the midget called Swift. None leaped so high at dawn. None dared so greatly where the water deepened.

"The shrew, bearing a last limp captive, scrambled up a boulder to glisten."

They made a song for him that you may not have heard; a song in which the chatter of the hastening river, the jingle of tumbling pebbles and the patter of rain on silver are one. Because these tones were in it you must remember that, at best, a translation can be no more than imperfect.

The River is Mother to Swift,
Mother to Swiftling, the bold;
She brings him this moment her gift—
The fly of the tunic of gold,
Mist on the mother by night,
Sheen on the mother at dawn—
Ho! He is brighter than light
(Is bright!)
Sudden and gleaming and gone!

Yet their play in the puddled shallows was not unvexed by peril. By the lesson of fear they recognized the menace of the scarlet crawfish, ambling awkwardly up from his lair—the crawfish, whose powerful pincers threatened before him as he drove the frightened fry into the least water, until retreat lay only in the face of that leering mask. Came, too, to sense the presence of the peering mink; to perceive the puzzled faces of coons; to know the dreadful blotch cast by the belted kingfisher, whose splash was death. Such peril was incidental to life in the shallows, but life in the shallows was vastly preferable to doom in the current.

It was the water-shrew, wrinkling his snout and baring his sharp white teeth, who ushered them on a certain day into the adventure of the open river. With the rise and fall of the far-off ocean the fry found themselves regularly in water inches deep and spacious for strategy, and again in brief land-locked pools. Though they strove against forgetting, play or plunder often held them until for freedom they must await the tidal rise. In such an hour the shrew came searching through the puddles and plunged upon the school.

Never had Swift a greater need for that which lent him his name. The beast was agile as a trout, avid for slaughter, and one by one he swam them down. Hunter and hunted roiled the pool in the savagery of pursuit, the flurry of escape, the spray of capture. Twice and again Swift flung his nimble litheness high above the enemy. He whirled and fled and foiled in an ecstasy of terror, driving his infant nose into the barrier of sand, seeking the stream beyond. The flow lipped again at the shallows, where the mother river flooded a channel—it broadened, deepened and through it flashed the school. The shrew, bearing a last limp captive, scrambled up a boulder to glisten.

Swift led the escape to the river, madly into the green current, and with him fled a dozen followers. Almost to the gray rock they darted before a striking trout drove them back again—yet not quite to the shallows. Both dread of the shrew and a comfortable confidence sustained the resolve not to re-

"It is the sea, little flounder," screamed sardonic gulls, "our sea, our sea!"

turn. At a price they had learned that they were masters of the fin and that death in the depths might be braved as stoutly as death in the shallows.

They mocked the sculpin who slipped so eagerly out from hiding. They flouted desirous trout and gibed the squawfish for a clumsy fellow. Ranging warily upstream and down, they sought food and adventure. In due time, upon such a purpose, they found the eddy that all well-instructed troutlings must attend. And a good eddy it was, though great fish sometimes cruised blandly through it, and the shadow of the osprey often troubled its sands. Swift and his companions made it their home, and became students of calisthenics and flies.

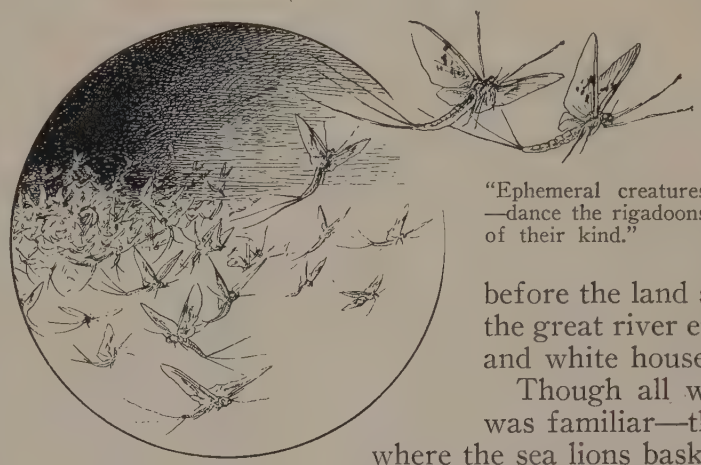
Of these the number and variety seemed infinite. Certain ephemeral creatures, with wings of gauze and bodies of brown, yellow or blue, or even white, chose certain days to dance the rigadoons of their kind, so that the provender of the pool was plentiful, and one could pick and choose, learning to judge both time and distance. There were fat stone flies, stupid and slow and easy of capture; there were glistening beetles; and, by way of diversity, there were queer sluggards encased in stone, who could be wrenched from the rocks and swallowed without need for hurry. Upon this food the infants of the river grew fat and lusty. They acquired color and roundness, and presently were almost without fear. The seasons changed, and the food, but always there was joy in the chase and play of the eddy, and always there was plenty in the river.

Swift had seen cutthroat at an earlier time. They were menacing banditti when first he left the shallows. Yet when, on a day in fall, there came to the eddy a cutthroat trout of twelve inches, swaggering as one with a story that he might unfold, he found that he had ceased to be afraid of them, and, side by side with this one, he raced for a spinning bluebottle, whose plight fretted the silver roof. In the impact of their bodies, as nose to nose they touched the surface, each missed his strike, so that the fly was tossed high in air. Flashingly Swift whirled and rose again, bright against the willows, to catch the morsel ere it touched water. He mumbled his prize as he came again to his station. The cutthroat ranged beside him. His praise was the compliment of one who, having traveled and tasted

life, can well afford to be generous. Under the swirling foam flecks of the eddy they talked. For the cutthroat was up from the sea.

"Queer sluggards encased in stone."

In the reflective mind of Swift was born a great hunger and desire, not to be reckoned in flies or larvæ. On a day yet to come the river would be darkened with silt from the far hills, and heavy with storm. It would be loud with the rush of many torrents and lashed by the drive of rains. Though a dozen such days might dawn in cloud and wind, he was to know his own when it came to him, to follow the heady current down, down, always downward, into the big river and away to the sea. As it had been with his kind since first the streams were peopled, so should it be with him. The cutthroat said that the tang of salt water was tingling and that it sheathed one in sheer silver. Impatience possessed the bucolic listener.



"Ephemeral creatures —dance the rigadoons of their kind."

Even as the cutthroat foretold, when that time came Swift knew it for his day. The river was blind with silt and wild and strange floods. The trout hurried aimlessly to and fro in the eddy. For Swift there was no lingering, no tremulous indecision. Leaping, he left the pool—one of the myriad company of that exodus, from lake and river and creek and rivulet, down and down to ocean.

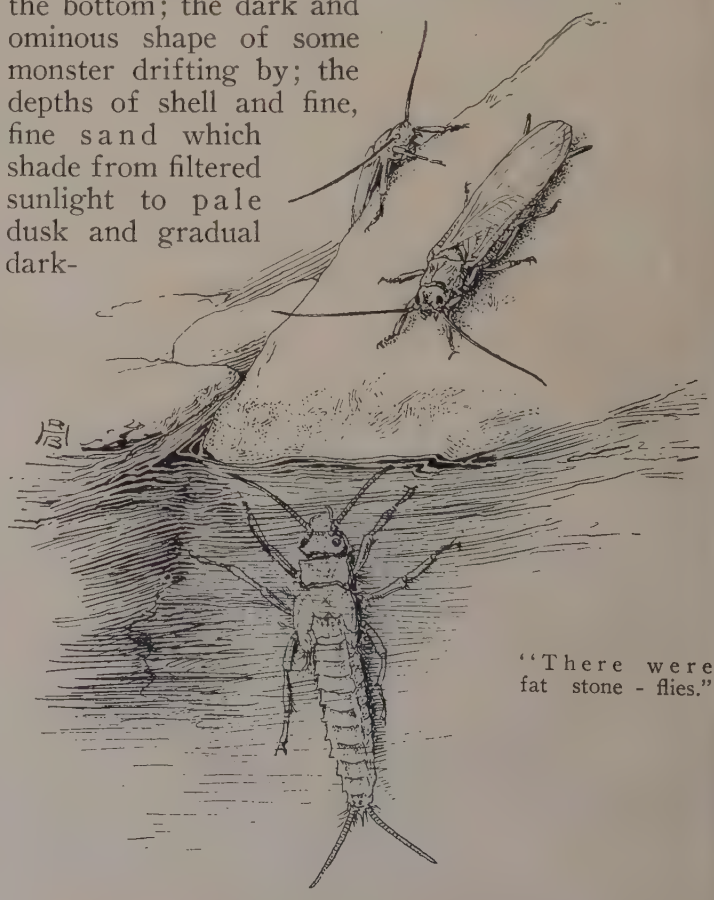
There was astonishingly little of incident in the great adventure. Swift fed on casual fat earthworms, paused to strike in jocular fashion at the abhorred sculpins of his youth, tasted with wonder the strange blend of the big river, his own stream quite engulfed, and came at length to an utter absence of current and a vastness of broad muddy bed—for the tide was full. His elders were hurrying now. He glimpsed them as they flashed past in the brown murk, eager and vibrant. Where they had loitered now they swam with powerful thrusts of fin and tail. And because he was Swift and none had dared him at this game he raced beside them—blindly forward.

A savor of marsh and rotted rushes and an odd promise of delight possessed the river. The water, as by some potent infusion, became charged with ecstasy—lightened, brightened, turned now to amber and now to a greenness more crystal than the stream of the gray rock. Giddiness claimed the fishling. He thrust to the left and entered an emerald province. Sudden and sharp his gills, his flanks, his rigidly astonished fins tingled to the tonic of a new fluid. Half frightened, yet wholly happy, he leaped to see a curving comber bear its white crest toward him.

"It is the sea, little flounder!" screamed sardonic gulls. "Our sea! Our sea!"

So the ocean claimed him, as she had claimed his countless ancestry before the land sank into the sea, and when the great river emptied where now are fields and white houses.

Though all was strange to him, yet all was familiar—the languid kelp by the cliffs where the sea lions bask; the flat, fringed fishes of the bottom; the dark and ominous shape of some monster drifting by; the depths of shell and fine, fine sand which shade from filtered sunlight to pale dusk and gradual dark-



"There were fat stone-flies."

ness; the rhythmic flow of the tides, and the shadows of the ships. A banquet was spread before him wherefrom he feasted without question, knowing that the unfamiliar foods were, after all, familiar and intended.

There were perils here, as by the gray rock, yet they were lessened—no enemy could trap him as the shrew had done, no bird could hunt him as had the belted fisher. He had but to dart, to leap, to dodge less than an instant before the rush of his pursuer and he was safe in an infinitude of water. The lanky cormorants flew out from the bird rocks to their fishing. They sought him from the swift current of the river to the undulant swells where the sails vanish and the smoke thins, but the sheen of his silver flanks alone rewarded them.

When seal turned their sleek heads downward and plunged in a veil of trailing air toward the school, Swift fled them without thought of fear. When the ugly skate flapped from some cavern or cliff, incarnate terror and lust, Swift moved as light does and was gone. In all that realm of ocean none was so fleet as Swift, though four great families of salmon were there and two of his own kin, the trout. To his swiftness came an added sense of strength, of keen-witted assurance—the magic of the sea.

"Flashingly Swift whirled and rose again—to catch the morsel ere it touched the water."

(*To be concluded*)

The Wolverine

(CONTINUED FROM PAGE 14)

prehistoric remnant of an ancient age is being crowded, or rather trapped, off the continent by humans who doubtless consider themselves vastly superior in intellect and far-sightedness to the folks of, say, the Stone age.

Were you privileged to glimpse the wolverine in the deep woods of his native haunts on the north shore of the St. Lawrence, or even out on the open reaches of the storm-lashed beaches—his last stand against the greed of the generation—you would never forget him. There is something so suggestive of tremendous muscular power in the short legs and stout body that a thrill would undoubtedly ripple up and down your spine. Loathing deep snow as a cat hates water, the ponderous creature, walking on the soles of his feet, shambles along the trail with a short, bear-like roll. His food, too, resembles that of bruin—trap-bait and animal caches in winter, and all sorts of animals and insects in summer. Indeed, so voracious is his appetite that in some localities he is more commonly known by the name of "Glutton." And he is surely well named because, give him the slightest presentiment that food lies somewhere in the wilderness about, and he will track it down with uncanny precision.

Though such cases are extremely rare, the writer has come across evidences of a woodland caribou having been attacked by a large wolverine. The tell-tale claw marks on the caribou's throat and shoulders showed that only too plainly, and it is quite easy to visualize the steel-muscled creature crouching on a big rock from which he springs upon the luckless caribou's neck and bears him to his knees.

The product of a vigorous climate, the wolverine boasts a fur coat of extraordinary thickness and beauty. The oily hair hangs low over the low flanks and legs, while across the back is a patch of darker colored fur known as the "saddle." This curious dab of sable fur, as well as its non-congealing properties, occurring only in one other animal in all the world, the muskox, sets these two northern mammals apart, as it were, from the rest of their kindreds.

The young, numbering from two to four, are usually born in June or July, and though I have been in contact with wolverines of every type during the last eighteen years, never have I yet had the opportunity of examining a litter. That pleasure has been reserved by Providence for a later date, perhaps, though the conviction is being slowly forced upon me that it will finally resolve itself into a

(CONTINUED ON PAGE 64)

How Grandmother Kept Well

By BESSIE L. PUTNAM

(PHOTOS COPYRIGHT KEYSTONE VIEW CO.)

WITH the nearest doctor miles and hours away, our grandmothers treasured many simple home remedies found in the woods and fields to treat the more common diseases. Even the small sum asked by the doctor often cut deeply into their scant income, and many things the doctor of today prescribes or the drug store sells was theirs at the expense of a little effort and a walk in the fresh air. Both of these, no doubt, had much to do with the cure. Our grandmothers never heard of "hiking," but they had a lot of faith in roots and herbs—and faith is a great thing. Still, some of these same plants today hold a reputable place in the modern materia medica.

LUNGWORT, A HEALING PLANT

Its leaves were frequently used in grandmother's time for lung troubles.

Even though there was no special ailment, grandmother, from general principles, always sought the sassafras thicket in early spring and dug some of the spicy roots. From the bark of these she made a tea as delicious as the best coffee or cocoa, especially when sweetened with maple sugar. This thinned the blood, usually thick and sluggish after the long winter.

She watched for the coming of the first blood-root blossoms, contemporary with the crocus and equally attractive. These starry white flowers were once common in rich woods, but are now rare or extinct in many places owing to this medicinal value. It is about the time of blossoming that the root is most valuable. It is a short rhizome which, when broken, yields a red juice that looks like blood. The Indians called it red puccoon and used it as a paint for decorating their faces, though a white person

JOE-PYE-WEED

Picturesquely named for an Indian doctor, this plant was a favorite old remedy.

with a sensitive skin may find its effects similar to those of poison ivy. The stem, leaves, and even the stamens and ovary contain the colored juice, orange or brown except in the rhizome. Only the petals are free from it.

The roots were washed, dried, and used for whooping cough, lung troubles, and affections of the liver. It was also regarded as an important alterative for impure conditions of the blood.

JACK-IN-THE-PULPIT OR INDIAN TURNIP

Its acrid root made appetizing food for the Indians and was made into syrup for coughs.

Though so innocent in appearance, this plant is very active in its properties. Sanguinarin, a concentrated preparation made from it, is an efficient drug—emetic, purgative, or stimulant, according to the size of the dose. Pity, too, that it was not years ago given a place among the useful plants in the garden, and so allowed to furnish the medicinal supply, leaving its beauty in the woodlands undisturbed. Some wild flowers do not take kindly to cultivation, but the bloodroot is as easily grown as the mints.

A little later in the year comes Jack-in-the-pulpit or Indian turnip, with features so distinctive that it can never be mistaken for any other plant. The small, turnip-shaped root, which grows near the surface, is very acrid and biting. The Indians dispelled this by cooking and found it a very nourishing and appetizing food. Usually the larger and more robust plants have flowers of darker color, followed by a cluster of flaming scarlet berries in later summer, even more showy than the flowers. The smaller spathes and those of light-green color as a rule shelter a column covered with stamens but no pistils, and form no seeds but die to the ground soon after flowering.

The plant loses much of its medicinal value in drying, and the fresh root always gives the best results. This was often mashed and mixed with vinegar, and a syrup made by adding molasses or honey. It was used for coughs and colds. A teaspoonful of the powdered root (dried and pulverized) was an effective dose for colic. The root was also used in

THE RARE YELLOW LADY-SLIPPER

Having a reputation for nerve tonic, this beautiful plant has been too widely gathered.

making poultices, especially for scrofulous swellings.

The lungwort, incorrectly called cowslip, was another much used plant in grandmother's time. Its most striking characteristic is that the buds are pink, changing to bright blue or lavender at maturity. The color combination is as pleasing as it is unusual and is a sure means of the plant's identification.

The leaves were the part medicinally employed, and an infusion of them was mucilaginous and healing, frequently used in lung troubles, especially in hemorrhage. Happily this plant, like the bloodroot and Indian turnip, readily adapts itself to garden

culture, spreading through the scattering of seeds more than by increase of root growth.

One of the greatest and most unwarranted sacrifices in the entire realm of medicinal plants is that of the yellow lady-slipper. It has most interesting as well as beautiful waxy yellow flowers, moccasin-shaped, and marked along the inner surface with dotted lines of reddish-brown. Scientists tell us that the latter are "honey guides," paths for the insects which perform a special work in cross-pollination. Even with this special provision for the perpetuation of the plant, it is growing more and more rare. The fibrous roots have been too much dug, an infusion made from them having a reputation as a nervine. It is to be hoped that where a scattering few plants remain, they may be protected in their native haunts, and some less rare remedy with more fresh air and exercise used to renew the shattered nerves.

TURTLE-HEAD OR SNAKE-HEAD

Found along the brookside, this plant was used often as a tonic.

In late summer the turtle-head or snake-head is familiar along brooks. The plant seldom grows in quantity. It always likes to be near but not in the water. The shape of the one-piece corolla explains the name. It is white, with the tips of its lobes slightly tinged with pink or purple. Balmony, shell flower, and bitter herb are other popular names. Like most of the medicinal plants, the leaves should be gathered at flowering time. Dry weather is more favorable to securing them, for moisture tends to induce mildew. It has been used as a tonic for jaundice, the liver, and the digestive organs. It is also said to act as a vermifuge. A tablespoonful steeped in a teacupful of water was a sufficient dose for a day. As a bitters it gave the best results when combined with golden seal or yellow root.

Almost every one knows boneset, which covers waste places, especially swampy tracts, in late summer, topped with clusters of dingy white flowers. It is often called thoroughwort, because the stem grows through the opposite leaves. There is often found growing with it a taller and more handsome plant of the same family called Joe-Pye-weed. The flowers are a soft lilac or purplish instead of white and are highly ornamental. This plant got its queer name from Joe Pye, an old Indian doctor who used the herb to cure that common epidemic of early times, "fever and ague." Both this plant and boneset have similar properties, an infusion being made of the leaves.

Many other plants were included in grandmother's collection, some less beautiful, few more so. Where the two combine there is special need of protecting the plant against extermination. Many of our wild flowers are passing. Most of the above named may be grown in the garden, where they can serve their purpose and leave the plants of beauty in forest and field.

Next month will be marked by the inauguration of color work in NATURE MAGAZINE. This plain statement does not fully convey the quality and beauty of the frontispiece that has been reproduced from the original painting done by our Art Editor, R. Bruce Horsfall. The subject of this first picture we will keep a secret. We will let you into the secret, however, enough to say that the picture will serve to illustrate in part another fascinating article by William L. and Irene Finley.

The Evening Skies in January

By ISABEL M. LEWIS

WRITE the twenty-fourth of January down on your desk pads and in your date book, for on that date there will occur in the skies something that you will probably never see again—a total eclipse of the sun in some places and a partial eclipse over the greater part of the United States.

Those who live within the confines of a narrow belt 100 miles wide and 5,000 miles long and flung from northern Minnesota across northern Wisconsin and Michigan, the Great Lakes to New York, Long Island, Connecticut and Rhode Island, parts of Pennsylvania, New Jersey and Massachusetts will see the flaming sun blotted out on the morning of the twenty-fourth. Those who live near this path across the country—a path that ends at sunset near the north of Scotland—will see the sun shadowed in part, the extent depending on how near they live to this belt.

THE PATH OF THE TOTAL SOLAR ECLIPSE

So on the twenty-fourth day of the new year the moon will pass between the earth and the sun, throwing its shadow on our sphere. It is the first total eclipse of the sun to be visible in this section of the country since the year 1806. No other total eclipse will take place in the same vicinity for more than a century. Though a partial eclipse is not an unusual occurrence in any one locality, it is not every generation that sees the moon smudging out the sun.

The eclipse will be total in Duluth, Buffalo, New York City, New Haven and many other large cities in this part of the country. The partial eclipse will be very large, nearly total, in some of the largest cities in the United States, including Boston, Providence, Albany, Philadelphia, Baltimore, Washington and Chicago. Even as far south as New Orleans, and as far west as St. Louis and Omaha, the partial eclipse will be large. In most of the central states the sun will rise more or less eclipsed; but from Lake Erie eastward, all of the eclipse will take place after the sun has risen. The total eclipse in New York City will take place about 9.10 a. m. and the time of the greatest eclipse for most of the cities in the east that keep Eastern Standard Time will vary but a few minutes from this time. The partial eclipse will begin about eight o'clock in the same section and the eclipse will be over about half-past ten.

When the eclipse is total we are at the center of the shadow cast by the moon. It is a time when many interesting things are to be seen that cannot be seen at any other time. A total eclipse is of great importance to the astronomer, for then he hopes to learn certain facts about the sun that cannot be learned at other times, and often astronomers travel many thousand miles to observe a total eclipse of the sun.

When the eclipse becomes total the brighter stars and planets appear and also the beautiful solar corona that the astronomer is so anxious to study. This is a magnificent halo of pearly light extending to a great distance from the sun and different in shape and appearance at every eclipse. It is never visible except during a total solar eclipse and can be studied only at that time because its light is so faint that the glare of sunlight in the daytime hides it from view. It is only when the moon obligingly comes between sun and earth and shuts out the light of the sun that the corona shines forth in all its wonderful beauty.

All those who find themselves within the path of total eclipse should look out for the shadow bands, wavy bands of light and shade that flit over the landscape and buildings just before and after the total eclipse. Also they should look out for the interesting phenomenon known as "Baily's Beads," which are seen as the thin, thread-like solar crescent breaks up into beads of light as the total eclipse is about to begin, and which are seen again just as it ends. Look also for the scarlet solar prominences during the total eclipse which are flames of glowing gases of hydrogen and helium rising from the hid-

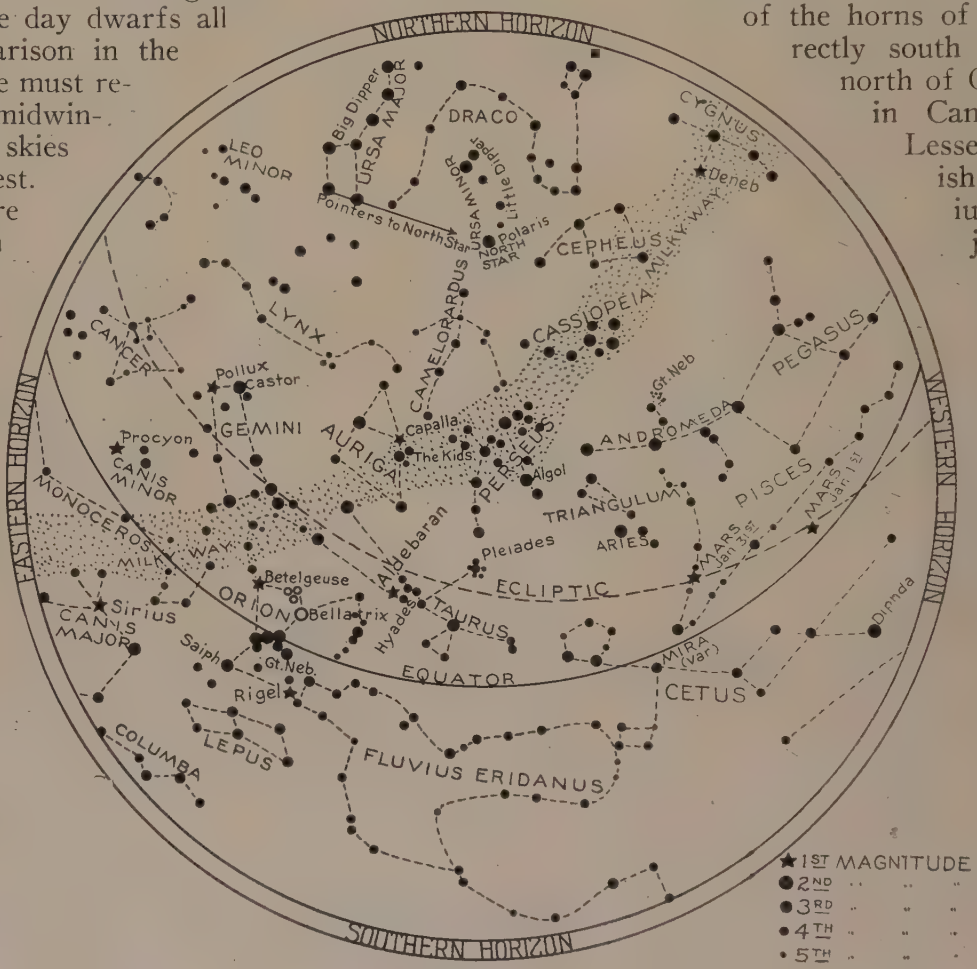
den surface of the moon to heights of thousands of miles and visible beyond the edge of the moon in queer forms and shapes.

The brighter stars and planets appear during the total eclipse, and even a little before and after it. The three planets, Venus, Mercury and Jupiter, should be seen in a close group some distance to the southwest of the sun. But above all else do not fail to make the most of your opportunities to observe the wonderful and mysterious corona which can never be seen except when the sun is totally eclipsed and which very few people ever have the good fortune to see. Although the event of this one day dwarfs all others by comparison in the January skies, we must remember that in midwinter the evening skies are at their best. There are more brilliant stars in view than at any other time of the year, sparkling more when the denser air is cold and frosty. If we could look at the stars *outside* of the earth's atmosphere, we would find that they do not sparkle at all but shine with a clear, steady light. We would see the stars in the daytime, too, as well as at night, for it is the atmosphere that scatters the light of the sun and makes the glare of light all over the sky that hides the stars from view by day. If we could do our star-gazing from the moon, we would be surprised to find the sky thickly studded with stars in the daytime, for on the moon there is little, if any, air.

Strange to say, many people fail to notice how greatly the stars differ in color. Most of us seem to be color blind in this matter of star colors! Nearly everyone is aware that the planet Mars is decidedly red, but how many know the colors of the first magnitude stars? Over in the southeast this month we have a good study in star colors. Take the constellation of Orion, alone. There is Rigel, blue-white in color, a perfect "diamond in the sky," and Betelgeuse in the same constellation is a deep red, a ruby rather than a diamond of the sky. There is Aldebaran, "the eye of the Bull," another deep red star in the Hyades, a little to the northwest of Orion, in Taurus.

As an example of a perfectly white star there is Beta Tauri, which is at the tip of one of the horns of Taurus and directly south of Auriga and north of Orion. Procyon, in Canis Minor, The Lesser Dog, is yellowish-white, and Sirius in Canis Major, The Greater Dog, following close on the heels of Orion, is white in color. Sirius is the brightest of all the stars, and because of its very great brilliancy and low position in the sky its light is more broken up by the earth's atmosphere than that of any other star. So while it is a white star, it sparkles more noticeably than other stars and sometimes seems to flash forth, momentarily, light of many colors.

Capella, in Auriga, is an example of a yellow star, and that is the kind of a star our own sun would appear to be if we could view it from a great distance. Capella, you will recall, is the She-Goat, and her three Haedi or Kids are close by. The Charioteer, Auriga, is holding Capella and "The Kids" in his arms.



AN AISLE IN NATURE'S CATHEDRAL OF THE REDWOODS

There is a silence stirred only by the swish of the wind through the upper trees or the murmur of a stream.

Nature's Cathedral

By RICHARD W. WESTWOOD

WE HAVE stood within the doors of a mighty cathedral, in a silence stirred only by the rustle of a priest's robes or the soft murmur of a prayer. Here and there the sunlight, catching a white patch in the windows, slanted in, splashing column or nave with a touch of light. All the rest was quiet, permanent and massive, seeming so to have stood for ages, and for ages yet to stand.

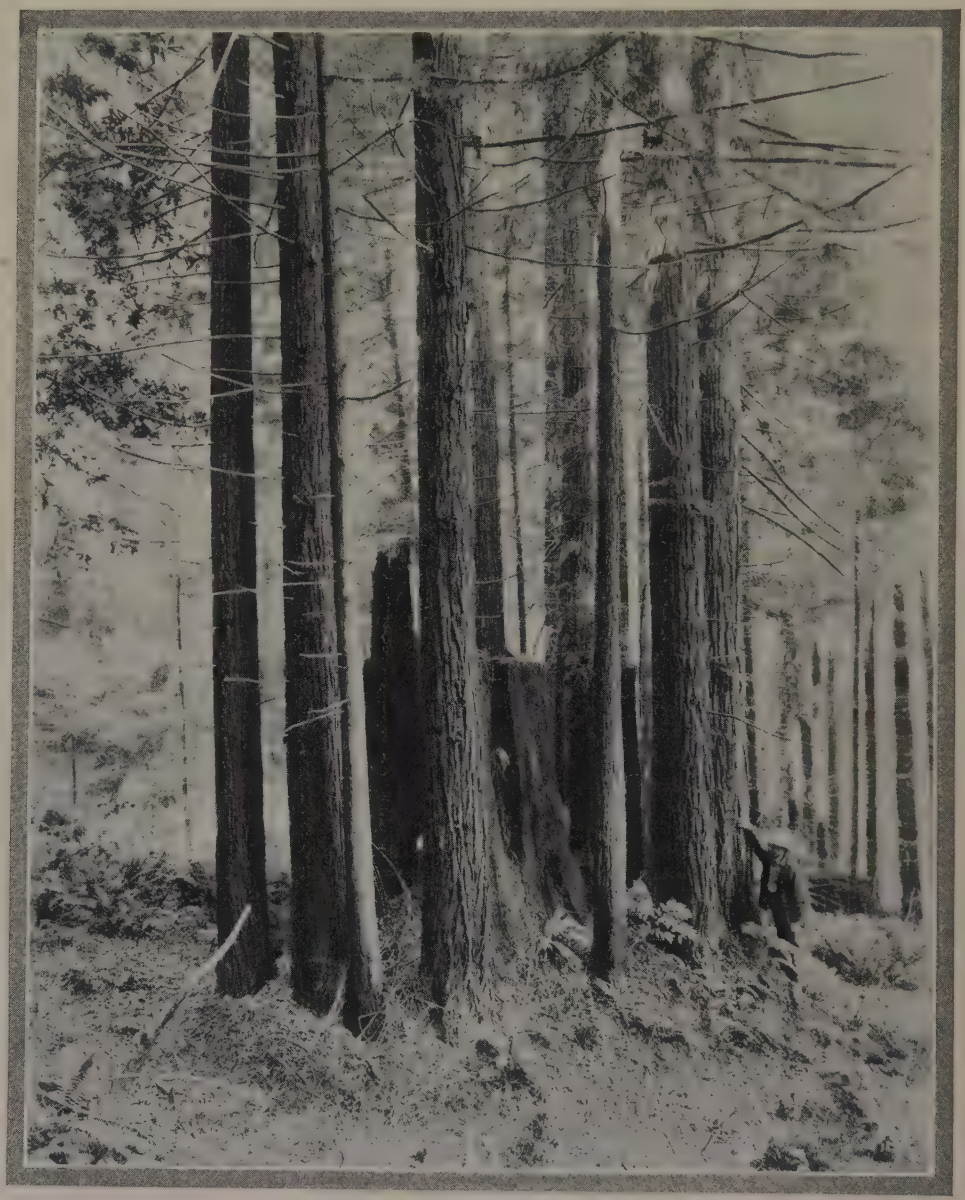
There is an impressiveness, both physical and spiritual, in such a scene, perhaps equalled by nothing, but certainly paralleled by one thing—the Redwoods of California. There it is a silence stirred only by the swish of the wind through the upper trees or the murmur of a stream. The columns are growing pillars of rich brown, against which the sun, breaking here and there through the top branches, flashes dusty golden spears. There, too, is a permanence and massiveness that gives to the great trees the sense of the antiquity which is theirs.

There are two pairs of eyes through which these trees of Nature's cathedral may be seen. One may look through the protective eyes of poetry and beauty, or through the eyes of commerce, industry and material prosperity. Both viewpoints are essen-

tial. Though really opposite, they are not, or need not be, antagonistic.

Up in isolated and sheltered spots in the Sierra Nevada Mountains of California there grow great trees, known as the *Sequoia gigantea.* We have seen them pictured in geographies and travel books with a two-horse rig driving through their tunnelled base. They are immense trees, but particularly are large at the base. Most of them are now included in federal or state reservations and are protected for the future. These are not the commercial trees.

Down on the coast, however, are the *Sequoia sempervirens*—redwoods also, and great trees—the towering commercial redwoods. They bulge out less at the base and rise up straight and clean two hundred and more feet to the first spreading limb. Originally there were about a million and a half acres of these trees flung along the northern California counties and lapping over a bit into southern Oregon. About one-third of these now have been cut and the trees turned into lumber.



OFFSPRINGS OF THE OLDER TREE

Root suckers grow from the large tree in center and live after it has been felled.

It is through these trees in Mendocino and Humboldt counties that the northern highway from San Francisco to Eureka and beyond makes its course. It is a glorious road—an aisle in the cathedral—between trees, some of which were growing there fifteen centuries ago. And it was over a considerable stretch of this road that the writer rode with the State Fire Warden of the Redwood Forest.

Turning off into the trees on Bull Creek Flat, one of the most beautiful groves, we stepped off one tree that had fallen and found it 345 feet long. We inspected several trees a part of the bases of which had been burned out, but the redwood was growing sturdily. On the road again, we came to a stretch where a fire had burned through several weeks before. One hundred feet up one tree was still smouldering and a freshening breeze was scattering sparks, so we stopped at the warden's lodge to send back a ranger. Farther along, by the side of a stream, we paused to look at a tree standing proudly and erect, 276 feet clean to the first limb.

After a long stretch of untouched redwoods receding on both sides into dim browns and blacks, we suddenly seemed to jump into the sunlight again. And into desolation! On the left stretched a field of great blackened stumps hardly softened by the vegetation that had grown in the year since the cutting had taken place. It was a shock. Yet a little further along on the right was a hillside on which grew young redwoods, the traces of the lumbering desolation that must have been there a decade ago, now gone. Not far beyond we passed a redwood nursery

of the Pacific Lumber Company, where tiny redwoods were growing close together in their infancy.

At Scotia we stopped to see these trees sawed into boards and ties. The great saw-log lengths splashed into the mill pond. A carrier captured them and piled them within the mill. Two great jaws grappled with them, clamping them to the shuttling carriage. The saw cut smooth, wide boards, which the other saws cut into widths and thicknesses. The redwood was transformed to meet the needs of a wood-using nation.

REDWOOD SPROUT REPRODUCTION

New growth coming in on land logged off four years previously.

It is here that the two pairs of eyes come in. The glorious trees lining the highway should line the highway. They are in themselves a monument equalled nowhere in their kind. Some of the finest growths still stand and should continue to stand. With this aim in view the Save the Redwoods League, which bears many distinguished names on its directorate, is working. Through purchase and gift, it has been possible already to preserve more than six thousand acres of redwoods, deeding them over to the state to be held not only for its people but for the people of the world.

Twenty-five hundred of the acres preserved are in the Big Basin, Santa Cruz County. Nearly three thousand acres are included in the Humboldt State Redwood Park. A particularly wonderful grove in the north, covering one hundred sixty acres, has been recently given over to the state as the Humboldt Pioneer Memorial Redwood Grove. It is the gift of Mrs. Zipporah Russ, who crossed the plains in 1852 and found, in the untamed country of Humboldt County, her husband-to-be, Joseph Russ, who had come from Maine by way of Cape Horn to pioneer in the new land.

The work of the Redwoods League, then, is to preserve outstanding groves and highwayside stands of redwoods. One phase of the latter part of this problem is that the redwood is not a deep-rooting tree, despite its great size. A sufficiently sizable stand must be acquired then, to prevent blowdowns. Six thousand acres, however, are only a small part of the million acres left. Several thousand more acres, properly selected, should be and will be acquired by the League. Many of the gifts of these trees, now of great value in terms of money, have been made by private interests.

GROWING PILLARS OF RICH BROWN

Great redwoods of the coast counties of California, tall, straight and impressive.

The other pair of eyes regards the redwoods from the economic and commercial point of view. Not only are they a part

YOUNG REDWOODS IN THE REFORESTATION NURSERY

Seedlings in the nursery of the Union Lumber Company at Fort Bragg. The Pacific Lumber Company carries on similar work.

of California's wealth of beauty, but, also, her wealth of resources. Resources must be used to produce wealth, work and prosperity. In other words, redwoods must be cut down to meet timber demands. The lumber companies owning and cutting redwoods recognize the need of saving the trees just as the Save the Redwoods League is saving them. They have aided it.

A lumbering operation in such timber must be clean; otherwise the trees could not be gotten out. Being clean, it must leave a desolation, temporary at least, behind it. Looking to the future, however, several of the companies, owning both uncut and cutover land, joined to employ a consulting forester. He studied their land and pronounced it admirably adapted for reforestation. On his advice they have embarked on such a policy.

The redwood tree takes a partial care of reforestation itself. From the main root it sends up root sprouts, or suckers. These live when the older tree has gone and grow into fair timber. To supplement these trees naturally left, two redwood nurseries have been established, now including about 1,300,000 trees. These will be used to fill out the spaces among the root sprouts and for planting on cutover lands that have not reforested themselves. In this way it is believed that the fast-growing redwood will produce a timber crop in fifty years that will have several times more board feet per acre than our eastern second-growth stands. Technically trained foresters are on the job, and the redwood lumber companies are "sold on the proposition" that the redwoods can be farmed as a crop.

So two pairs of eyes are needed by the visitor to the redwoods. They are glorious, and one would be without vestige of sentiment if he did not feel it sad to cut them. They are also commercially and economically of great value, but only so when they have been felled and sent to the mill.

"OUT OF the swirling murk and fog and mystery of the Scotch highland moors, he trotted first into the limelight." This is the sentence opening the first of a series of articles on dogs that Albert Payson Terhune is writing for NATURE MAGAZINE. The series begins next month and the opening article is one about that beloved of dogs, the collie. It is written as Mr. Terhune writes, and is full of his fullness of knowledge of the dog world.

Shall We Use Scientific Names?

This question comes to the fore many times in the experience of Nature Study Teachers and Nature counsellors and the answer is not so difficult after all. The mystery of scientific nomenclature is not well understood by many educated people even; this is noticeable in the way that they confuse the terms "genus" and "species." This discussion is especially for those who are in the habit of saying, "Oh, how am I to remember all of these long, hard scientific names?"

Every known member of the plant and animal kingdoms has its scientific name of two words, which it shares with its kind; the first tells the genus to which it belongs, and the second the species. Thus our common red squirrel is *Sciurus hudsonicus*. The genus *Sciurus* includes other squirrels, as *Sciurus fremonti,* common in the Rocky Mountain section, or *Sciurus douglasi,* the squirrel of the Redwood forests of the Pacific Coast, etc., but the second name *hudsonicus* shows that it is the Eastern red squirrel and nothing else. It is readily understood that it is necessary to the classification of living creatures that each kind have its own special name. However there are so many thousands of kinds to be named that the scientists have turned to the lexicons of the Latin and Greek languages, and have been lavish of words of many syllables, which renders their nomenclature mere jibberish to those unfamiliar with the fauna, flora and lexicons.

We have always noticed a tendency of the systematist to select a name worth looking at, and often out of proportion to the size of the object named. There is an insect so small that it lives its entire life in one clover seed. It is so small that the point of a pin would cover it, and yet it belongs to the family *Chalcididae,* the subfamily *Eurytominae* and its name is *Bruchophagus funebris.* When they named a common ant, *Camptonotus herculeanus pennsylvanicus* it does seem, in common parlance, as if they were "going some." It is interesting, too, to note how easily the habit of calling things by their scientific names may be acquired. We know many people who reel off these names with a facility that takes the hearer's breath away. To persons of this sort a "Primrose by the river's brim" would ever be *Primula acaulis* to him and nothing more; however, few such savants occur among the teachers in our grammar schools and primary schools, and we need not mourn over that fact.

Luckily for the public at large, popular names have been given to most of the common plants and animals. To be fair, we must acknowledge that the most eminent scientists, dyed deep in lexicons, have themselves suggested many of these names.

There is only one drawback to their use, and that is, the same name may be applied to different species in widely separate localities. The trailing arbutus is known in New England as the Mayflower, but in Western New York the hepatica is called Mayflower. "Partridge" in New England means the ruffed grouse, but in Virginia it means quail. Such instances create some confusion but form no real obstacle to the use of popular names.

It is plainly the privilege of the Nature Study teacher to use popular names to the greatest possible extent, and when there are two popular names for a species to choose the most descriptive and attractive; for instance, "Queen Anne's Lace" is a much more attractive name than "Wild Carrot" and much more descriptive of the exquisite umbels of this common weed. If there is no popular name, use the scientific term and use good pedagogy with it by never asking the pupills to commit to memory, or write out these names as a means of learning them. Simply call an object by its name repeatedly in their presence and they will soon be using the term familiarly.

Nor need the length or complexity of the word be a matter of worry. Most children like a "word that is a mouthful" as soon as their tongues master it. We shall never forget the little neighbor who used to come to our door, with eager face and muddy over-alls demanding sympathy in beholding the beauty of his captured treasure, a spotted salamander, which he proudly called my "ambystoma," a word he had chanced to hear applied to it by a professor of zoology.

We have had a long experience in interesting young children in flowers, and have been astonished to note how soon they learn the parts of the flower. We begin—the petals of this geranium are red—the petals of this pansy are blue, etc., until "petals" becomes a common word in the child vocabulary.

The rule to follow is to use popular names as far as possible, but when the limit is reached, use the scientific names, sensibly and without any "fuss and feathers."

WHAT is the story of the clouds? What do they tell us of the weather and the wind? Charles Fitzhugh Talman tells us in another of his interesting articles in the February issue.

Hints to Teachers on Nature Subjects

By ELIZABETH K. PEEPLES
Instructor of Natural History, Washington, D. C.

This discussion of articles in the Magazine, together with hints to teachers on how to use them in their class work, is proving most helpful in Educational Work

My Friends the Deer A delightful lesson on deer, emphasizing kindness to dumb creatures and the joys of having pets, may be built up around this account of the taming of the deer of Hardy Island. Where live deer or museum specimens are out of the question, the numerous illustrations furnish abundant material for a study of the animal. The article adds information regarding the different species of deer, the shedding of antlers, the young, fighting among the bucks, the wild companions of the deer of Hardy Island, and the establishment of Government preserves on this and the two islands nearest. The opening paragraphs are a pleasing account of the author's experience in making pets of these wild neighbors, which should prove an incentive to any youngster to enlarge his circle of animal friends.

* * *

The Vanishing Flame-Colored Flamingo Every teacher who has tried it knows that she can teach a bird a day throughout the school year without fear of monotony, so marked is individuality among the feathered folk. Distinctly odd, and equally fascinating, is the flamingo. Forearmed with the facts given in the article regarding this now rare bird, the teacher whose class may be taken to a zoo to see a live flamingo is in possession of every requisite for a thrilling lesson. In the absence of the live bird, the pictures must be substituted as material. The story of its near-extinction and final protection by the government is a striking instance of the need for the conservation of bird life. Having discussed the flamingo, the children will enjoy and benefit by the use of the text as supplementary reading. May I add for those who believe in correlation (and who does not?) that these Nature lessons make splendid topics for composition; and that in the present instance the charm of the flamingo pictures is so marked that they might be used for lessons in art appreciation or design as well as for the Nature lesson itself?

The Wonderland of Ice This topic and the manner in which it is treated make it a particularly good one for a socialized recitation. Divide the class into committees, letting each committee choose one of the following phases of ice study as its contribution to the lesson: (1) Discussion of the attention given by scientists to the study of ice; (2) experiments to show crystals in blocks of ice; (3) explanation of processes by which snow forms and is converted into ice, and by which a pond or lake freezes; (4) discussion of glaciers and icebergs; (5) description and explanation of other forms of ice floating on the sea, or attached to shores: field-ice, drift-ice, floe, bergy bits, pancake-ice, brash; (6) description and explanation of forms of ice on land, in running water, etc.: anchor-ice, frazil, fossil ice, ice fringes, hoarfrost, window ice, rime, glaze, ice storm, frost smoke. Ask the children to try to find pictures to illustrate the forms which they discuss. Collect for their use as many copies of NATURE MAGAZINE containing this article as possible. Provided the class makes thorough preparation, the lesson will be a lively one.

* * *

The Pitcher Plant of the North, South, and West The pitcher plant, listed by the Wild Flower Preservation Society as one of the wild flowers so near extinction that it should not be picked, is such an interesting study that a Nature class can ill afford to overlook it; but in teaching it let the story of its destruction in the college town near Bear Meadows, as told in the article, be a warning. Select the species which grows in your neighborhood, and have the children study its structure with special attention to the devices employed in capturing its prey. Unless there is a pitcher plant near enough to be visited upon its native heath, teach from pictures and diagrams. The different kinds of pitcher plants, and the insects which find them graves—or occasionally boarding-houses—constitute an interesting sequence of lessons. Why Nature has developed the carnivorous habit among plants, a much discussed but as yet unsolved mystery, offers a field for original research to the young seeker after truth.

* * *

Points About Porcupines This animal story, equally delightful to children from eight to eighty, should be read to or by the pupils according to their age. First there might be a visit to a porcupine at a zoo, or in some museum collection, or if there is no porcupine, alive or stuffed, to study, a schoolroom collection of porcupine pictures to supplement the excellent ones which illustrate the story can be made. Discuss porcupine propensities and peculiarities, and then the story! Pictures of porcupines should be added to the Nature Scrap Book. Recently a teacher was overheard to say, "I have two subscriptions to NATURE MAGAZINE. One copy is to keep: the other to cut up so that I can mount the pictures for lesson material. It is an inexpensive way to get good Nature Study pictures.

* * *

Tom and Bob The pet kitty is naturally one of the first subjects for animal study; and just as naturally its wild relatives follow next in order. The bobcat is interesting, but its interest doubles when it is contrasted with our familiar tabby. After lessons on the pet cat there should follow observation of a live bobcat (if one can be visited in a zoo, or procured for study), or a development lesson using the pictures and information given in "Tom and Bob." Salient points are the difference in the appearance and disposition of the tame cat and the wild cat; the helplessness and slow development of wild as compared with tame kittens; savage instincts displayed by the wild cat over raw meat, and by the tame over a bird; and the taming of the wild cat, with its lesson in the keenness of the animal mind, and in human sympathy and kindness. Finally, the story should be read by children of the intermediate grades, or told to primary pupils.

(CONTINUED ON PAGE 54)

Farmers Protect Quail

Recognizing the value of native birds, particularly the quail, in protecting crops by making their meals of destructive insects, the farmers of the Providence community near Coltewah, Tennessee, have banded together in bird protection. They have organized themselves into a committee, the members of which are pledged not to shoot quail for at least two years and to prohibit the shooting of this bird on their farm property. A slogan of their campaign might be, "No Quail, No Crop," and once more the economic argument wins.

Magpies and Cattle

The Magpie of our western states at times indulges in carnivorous habits that result in serious losses to owners of livestock. During periods of severe winter weather and when food is scarce early in spring, these birds may attack sick and weakly animals in a way that often resembles the depredations of the kea, the carnivorous parrot of New Zealand, according to the *Biological Survey*.

Wounds formed by branding or dehorning operations frequently offer an inducement for the birds to start feeding on the living creature. This may be continued until the animal is either seriously wounded or, in some cases, killed.

Lives of Birds

Flesh eaters in the bird world appear to enjoy longer lives than the vegetarian species, although the swan, a vegetarian, frequently lives out a century. The crow, eagle and raven are the longest lived common birds, according to a study of Methusalaism among our feathered friends. Studies have worked out the average ages of some of the familiar species of birds as follows: blackbird, 12; canary, 24; crane, 24; chicken, 10; goldfinch, 15; goose, 50; heron, 59; lark, 13; linnet, 23; nightingale, 18; parrot, 60; partridge, 15; peacock, 24; pelican, 50; pheasant, 15; pigeon, 20; robin, 12; skylark, 30; sparrowhawk, 40; thrush, 10; wren, 3.

Forests and Recreation

In the light of the great movement toward recreation in the out of doors in this country, it is interesting to note that there were 2,181,532 visitors in 1924 to the twenty-two National Forests of Oregon and Washington. This is an increase of more than 600,000 above the figure for 1923 and does not include the thousands who visited the Rainier and Crater Lake National Parks in these two states. What is even more encouraging is that the district forester was able to trace only 236 of the 1972 fires in these forests to careless campers.

Klamath Fish Safe

Conservation of the fish that swim the Klamath River was assured in California when the people went to the polls on election day and voted by a majority of more than 170,000 against the bill that would have permitted building a 250-foot dam at the mouth of the river. The measure was brought before the people through an initiative petition, and it found conservationists, sportsmen and the State Game and Fish Commission united against this power development at the expense of the fishery resources of the state. The fight, also, contributed largely to arouse the conservation sentiment of the people of California.

Iowa Bans Billboards

Taking action against billboards as a measure of public safety through a new law, Iowa has found that the step results, also, in conserving scenic spots for the enjoyment of the traveling public. This has been the experience of other states that have enacted billboard restriction, and the number of these is growing rapidly.

Thirsty Squirrels

The question has been raised about the water-drinking habits of squirrels, and Dr. Vernon Bailey, Chief Field Naturalist of the United States Biological Survey, has the following interesting comment to make:

"There are ground squirrels in the arid regions which may live their whole lives without drinking water or ever knowing what it looks like, but their food is entirely different from that of our eastern tree squirrels and supplies all the water they need. The tree squirrels all require water and drink at frequent intervals, at least every day, and in warm weather several times a day if water is available. Without water they soon suffer from thrist and will unmistakably beg for it if their water dish becomes empty as do the squirrels accustomed to drinking in my back yard. In dry weather they are often forced to leave their regular haunts and move long distances to obtain water. In the forest they have regular routes through the tree tops and well-worn trails along logs leading down to streams or pools where they drink. Often they will reach down for their whole length and, hanging by their hind feet until the nose touches the water, drink long and eagerly.

"Squirrels, like other rodents, drink with the mouth held touching the surfact of the water and the tongue or throat moving rapidly, apparently sucking or pumping up the water as does a horse or cow, not lapping it up as do cats and dogs and other carnivores. In city parks and private grounds it is as necessary to provide water as food if the squirrels are to remain and thrive. It is no kindness to feed and water them a part of the year and then leave them hungry and thirsty until they are forced to move away and hunt for new friends and better homes."

(CONTINUED ON PAGE 56)

NATURE MAGAZINE

An Illustrated Monthly With Popular Articles About Nature

35 Cents a Copy JANUARY, 1925 Vol. 5, No. 1

Table of Contents

Nature Calendar 3
My Friends, the Deer ..... T. Brazil 5
The Flame-Colored Flamingo ..... C. B. Ely 11
The Wolverine ..... W. MacMillan 14
Wonderland of Ice ..... C. F. Talman 15
The Pitcher Plant ..... A. A. Hansen 21
Points About Porcupines ..... E. H. Baynes 25
Nannyberry and Cranberry ..... S. F. Hamblin 29
The Broken Timber 31
Tom and Bob ..... W. L. and I. Finley ... 33
Silver Pilgrim ..... B. H. Lampman 37
How Grandmother Kept Well ..... B. L. Putnam 42
Evening Skies ..... I. M. Lewis 45
Nature's Cathedral ..... R. W. Westwood 47
Nature Study Review ..... A. B. Comstock 51
Hints to Teachers on Nature Subjects 52
Nature News and Views 53

Managing Editor
PERCIVAL SHELDON RIDSDALE

Associate Editor
ARTHUR NEWTON PACK

Assistant Editor
RICHARD W. WESTWOOD

Editor Nature Study Dept.
ANNA BOTSFORD COMSTOCK

Art Editor
R. BRUCE HORSFALL

Field Naturalist
WILLIAM L. FINLEY

Business Manager
RALPH R. SHEHYN

SCIENTIFIC CONSULTING BOARD

The following scientists have agreed to act in a consulting capacity for Nature Magazine; and, as far as practicable, articles dealing with their specialties have been submitted to and reviewed by them, thus insuring scientific accuracy.

Vernon Bailey, Chief Field Naturalist, Biological Survey, U.S. Department of Agriculture

Dr. Paul Bartsch, Curator of Mollusks, U. S. National Museum

C. W. Gilmore, Curator of Vertebrate Paleontology U. S. National Museum

Dr. L. O. Howard, Chief of Bureau of Entomology, U. S. Department of Agriculture

Dr. Harry C. Oberholser, Biologist, Biological Survey, U. S. Department of Agriculture

Henry O'Malley Commissioner of Fisheries, U. S. Department of Commerce

Edward A. Preble, Biologist, Biological Survey, U. S. Department of Agriculture

Dr. Waldo L. Schmitt, Curator of Marine Invertebrates, U. S. National Museum

Dr. Edgar T. Wherry, President, Washington (D. C.) Chapter, Wild Flower Preservation Society of America

Nature Magazine is published monthly by the American Nature Association.
Entered as second class matter, March 4, 1924, at the Post Office at Washington, D. C., under the Act of March 3, 1879.

Copyright, 1925, by American Nature Association.

Publication and Editorial Office, 1214 16th Street, Washington, D. C.

Hints to Teachers

(CONTINUED FROM PAGE 52)

The Silver Pilgrim This delectable fish story, which pupils of the intermediate grades and high school should read when studying the subject, affords a sympathetic understanding of fish nature, and genuine enjoyment of fish life. In reading it the children cannot fail to form a vivid mental picture of the water world, its swift perils, lurking dangers, and varied population, who, as the case may be, are the companions, enemies, or the prey of the young trout, the hero of the tale. Classes in English will profit by reproducing in their own words such fine bits of description as those of the river and ocean depths; or such episodes as Swifts' escape from the shrew, and his race with the cutthroat trout for the bluebottle. Both English and Nature classes should commit to memory the song made for Swift, and Rupert Brooke's lines which introduce the story.

* * *

How Grandmother Kept Well Their medicinal value suggests a new point of contact in studying wild flowers. It may serve as an added argument for the cultivation of wild flower gardens, and the protection of the plants in their native homes. Besides pictures and descriptions, the special curative properties and method of preparation of the following plants is given: sassafras, bloodroot, Jack-in-the-Pulpit, lungwort, yellow lady-slipper, turtlehead, boneset and Joe-Pye-weed.

* * *

Nature's Cathedral General Science classes studying Forestry, as well as Nature Study classes intent upon trees will find the California redwoods a topic of peculiar interest. It is unfortunate that comparatively few such classes can visit a redwood grove. Where this incomparable field trip is impossible, the teacher must perforce fall back upon slides, such as may be borrowed from the U. S. Forest Service, museum exhibits, and good photographs like those illustrating the article. With the help of these visual aids and the article itself the pupils will be prepared to discuss the appearance of redwoods, comparing them with other trees, the present location of redwood groves, and the redwood's natural method of reproduction. The Forestry classes will wish to include in their discussion the decrease through lumbering, the work of saving and the cooperation of lumber companies.

"Just What I Have Always Wanted!"

Will You Accept This Book FREE?

MILLIONS upon millions of books fill the shelves of our libraries. Within these illimitable rows are treasures richer than Ali Baba's cave ever held. Here is knowledge, education, culture, entertainment. The jewels of civilization are within these books. What priceless benefits we could obtain from them—*if only we had time to read them!*

There is the problem. How can we hope to read even a small fraction? Which are the books we should read, and where shall we begin? In our perplexity we put off the worth-while reading we have promised ourselves. We seldom get beyond current fiction.

The vital need

Now, what is really needed is a book that will tell us what to read—and when.

The book you see pictured above is that book. Here at last is the key to the literature of the world; the solution to the reading problem of the busy man or woman. For this book contains the famous new reading plan created by nine eminent men of letters—Dr. Lyman Abbott, John Macy, Richard Le Gallienne, Asa Don Dickinson, Dr. Bliss Perry, Thomas L. Masson, Dr. Henry van Dyke, George Iles, and Dr. Hamilton Wright Mabie.

An unique new plan

The plan that these great authorities devised is absolutely unique. From the immortal literature of the world they have selected just the elements essential to a cultured person's reading. And these selections they have arranged in a day-by-day program covering a full year. Your reading is scheduled for each day. And the selections are so arranged as to be of timely interest.

Thus, on July 14th, the anniversary of the fall of the Bastille, your reading takes you into the stirring days of the French Revolution.

In this way your reading is filled with fascinating variety and covers the masterpieces of fiction, historical description, poetry, drama, essays, biography. *Only twenty minutes a day are required.*

Already this fascinating new plan of reading has been hailed with delight by thousands. "This is just what I have always wanted!" people say when they see this book—the only book of its kind in the world.

A remarkable offer

It would be difficult to set a price upon The Daily Reading Guide. But you are not asked to purchase it. A remarkable offer brings it to you FREE. A limited number of copies are to be distributed without cost, for the publishers believe that by this simple new plan will encourage many people to do more worth-while reading.

So by taking advantage of this introductory offer NOW you will receive one of the free copies. Simply mail the coupon, enclosing only 25 cents to help cover the costs of handling and postage, and The Daily Reading Guide will come to you at once. To avoid disappointment it is important to send at once.

NELSON DOUBLEDAY, Inc.
Dept. Y-1231
Garden City, New York

Nelson Doubleday, Inc.
Dept. Y-1231
Garden City
New York

Gentlemen: Please send me a copy of The Daily Reading Guide, containing nearly 200 pages, bound in rich blue cloth, which contains the complete new plan created by nine eminent men of letters for reading the essential literature of the world in only 20 minutes a day. I enclose 25 cents (in currency or stamps) to pay handling and shipping charges. There is to be no further cost.

Name.....

Address.....

City.....State.....

Nature Entertainments

TREES, BIRDS, FLOWERS

Illustrated by
DIRECT COLOR-PHOTOGRAPHY
MOTION PICTURES (IN COLOR)
STEREOPTICON SLIDES

GUY C. CALDWELL, Tree Surgeon
(Licensed Guide in the Rocky Mt. Natl. Park)
NATURALIST—ENTERTAINER

"The exactness of the imitations was astonishing."—Pueblo (Colo.) Star-Journal.

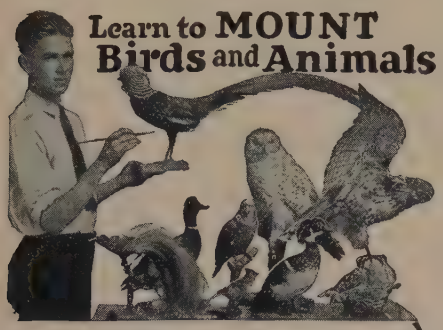
Mr. Caldwell's collection of autochrome plates cover the Rocky Mt. flowers and scenery and the wonderful flora of the Arizona desert.

Linen prints of 12 Rocky Mt. flowers $1.60
Lantern slides of western trees, flowers, scenery, etc.

ON THE EAST FACE OF LONG'S PEAK (14,255 FT.)

For terms and open dates address
GUY C. CALDWELL, 1260 Penn. St., Denver
All inquiries in Mr. Caldwell's absence will be promptly forwarded and answered

Learn to MOUNT Birds and Animals



Boys, Learn Taxidermy

Make it your hobby. Great sport and lots of fun. Intensely interesting. **Earn money in your spare time** to buy guns, traps, fishing tackle, athletic goods. Mount your own specimens and sell them. Do the work for others at taxidermists' regular charges. Thousands of boys and young men have learned to be expert taxidermists through our lessons. You can do the same.

FREE! Beautifully illustrated book—**"How to Mount Game"**, containing dozens of photos of mounted specimens. Tells how you can learn, easily and quickly, to mount and stuff all kinds of game, birds, animals, fish—tan furs, make rugs, robes, etc. Just send your name and address on the coupon. Book is Free. No obligation. Write today!

Free Book Coupon!

Northwestern School of Taxidermy
1451 Elwood Bldg., Omaha, Neb.
Send me your free illustrated book "How to Mount Game". Also tell me how I may learn this fascinating art easily and quickly by mail. No obligation.

Name .....

Address .....

"Be Wise"

"Say it with BIRD HOUSES"

3 for $5.00 and Post charges

Weight 10 lbs.

Bluebird Robin Wren

CRESCENT CO., "Birdville," Toms River P. O., N. J.

New Design Colonial Solid Brass Bird Cage

Valued at $12.00. Our special introductory price is $6.00. We pay the postage. Your money back if not satisfactory. Only a limited number will be sold, so send your order at once.

AMERICAN CAGE CO.
514 18th St., Racine, Wisconsin

Feed the Birds

Put out
THE PACKARD
Automatic Food-House

Keeps the food dry; feeds automatically; avoids waste; lasts years; weighs a pound and a half.

$1.00 each—Why Pay More?

SPECIAL MIXTURE BIRD FOOD
A balanced ration; best for the birds; best for use in the food-house
1 pound 25 cents—10 pounds $2.00
Everything for Wild Birds
Catalogue Free

WINTHROP PACKARD, Canton, Mass.

PUT YOUR IDLE LAND TO WORK

Reforest With Our Forest Planting Stock
Send for prices and planting instructions to
Piedmont Forestry Company
Bound Brook, N. J.

GOLD FISH

Imported Japanese and American Fish, Aquatic Plants, Castles, Globes, Food. We make artistic aquariums suitable for beautiful homes, conservatories, schools, the office, etc. Illustrated circulars free.
PIONEER GOLD FISH CO., Racine, Wis.

Save 1000 Steps

With newly invented Service Wagon. Goes everywhere—has 1001 uses—better than a maid. Has large top, removable glass service tray, large drawer, 2 handles, deep shelves, silent swivel wheels.

FREE Descriptive pamphlets of this labor-saver and name of nearest dealer sent FREE. Write today to

Combination Products Co. 504 N Cunard Bldg., Chicago, Ill.

Attract Ducks! Fish! Game! Birds!

To your favorite haunts by planting food for them---Wild Rice, Wild Celery, Waterlilies---32 other varieties---something suitable for every condition. Our 25 years' practical experience your guarantee of satisfactory planting. Free booklet and planting advice. Write for it.

TERRELL'S AQUATIC FARM
44 W. BLK., Oshkosh, Wis.

Protecting Roses

Some rose bushes can stand severe winters but others are susceptible to the cold and should be given special care, says the New York State College of Agriculture. If you are vain of your Rugosa, Persian yellow, Setigera, Memorial or Briar bushes, do not fear for them despite the coldest weather. Hybrid perpetuals such as the General Jacqueminot and American Beauties can survive with only a mulch of manure or leaves. But, the college warns, the delicate hybrid tea varieties that blush so beautifully in the warm weather fear the cold. It is suggested that a cone-shaped mound of dirt eight or nine inches high be scraped around the plants and the tops bent down over the mount and covered with soil. Another method is to dig up the whole plants and place them flat in a trench one and one-half feet deep, mounding the soil well above the ground and covering with a thick layer of litter after the ground freezes.

Wisconsin Votes Right

Reforestation in Wisconsin is an assured program for the future as a result of the vote of the people at the recent election in approving a constitutional amendment permitting the state to embark on a work of tree planting and acquisition of forest land. The vote was 336,360 to 173,563 for the amendment. Mr. Charles Lathrop Pack, president of the American Tree Association and the American Nature Association, congratulated the people of the state in a telegram to the governor.

Living Natural History

This is the title given to a series of educational motion pictures prepared by Dr. Raymond L. Ditmars, of The New York Zoological Society, and now announced by Dr. Ditmars as ready for release. This is an extensive series of pictures dealing with biology, and worthy of presentation before a class during an extensive course of study. The preparation has been made with the same care as the writing of a textbook. It embraces representative reels on the mammals, birds, reptiles, amphibians, insects, spiders and allied forms, and marine life. The reels are arranged in the sequence of zoological classification and include structural details and many life histories. Also, as a solution of the rental problem, the reels are offered for sale outright, printed on either standard, or narrow, non-inflammable film. Dr. Ditmars is in charge of this work.

Woodpecker Apes Chickadee

In the nature notes of the Yosemite National Park, Enid Michael tells an interesting story of a close-up view of a white-headed woodpecker. The bird was quite fearless, so that she could be approached within six feet as she fed among the leaves at the very ends of the branchlets. She appeared to be eating aphids and other small insects found among the terminal buds. In searching among the leaves she had the aspect of a chickadee, while with her strong claws and heavy feet she had a parrot-like grasp. She seemed very successful in gathering insects, and it was noted that her bill was wet with the juices of crushed bodies.

American Forestry Association

Celebration of the fiftieth anniversary of the founding of the American Forestry Association will be combined with the annual meeting when the members of the Association gather in Chicago on January 22. The meeting will be held at the Hamilton Club, and the hosts of the occasion will be the Illinois Forestry Association. Among the chief topics for consideration at the meeting will be the extension of National Forest ownership through larger appropriations and the problem of carrying into effect, so far as the states are concerned, the provisions of the McNary-Clarke Act.

Pack Prize at Penn State

Paul M. Wentworth, a senior in the Forestry Department of the Pennsylvania State College, is the winner of the Charles Lathrop Pack Foundation Prize in Forestry, according to an announcement by the college authorities. The subject of the prize-winning article was "Forest Reserves for Timber Supply and Recreation," and the faculties of both the English and Forestry Departments cooperated in selecting the successful paper. Commenting on the effect of the prize in achieving the result of popularizing the viewpoint of foresters toward their work, Prof. J. A. Ferguson says that "already several students have indicated that they are going to take a course in journalism to prepare them to write for the prize."

3,000 to One

One is moved to wonder whether the story from Nevers, France, constitutes a measure of power in the bird world. It is said that business was suspended one day to witness the strange sight of some 3,000 crows pursuing an eagle through the air. The eagle was brought down and at once the flock of crows disbanded their pursuit formation and departed.

Growing Redwood *for* coming generations

Extensive reforestation program will provide a constant supply

The Pacific Lumber Company's Redwood Nursery at Scotia, California

AT Scotia, California, can be seen millions of tiny plants that during the next hundred years will become tall Redwoods, clothing the hills with forests of mature trees for the use of future generations.

Government statistics show that today there is a stand of over seventy-two billion feet of commercial Redwood (Sequoia Sempervirens) in three coast counties of California. This is more than sufficient to last 100 years, after allowing for the reasonable increase in cutting, which will naturally come when the merits of this remarkable specialty wood are more widely known.

This timber supply is entirely independent of the Big Trees (Sequoia Gigantea) which grow in isolated stands in the interior of the state, chiefly in national or state reservations.

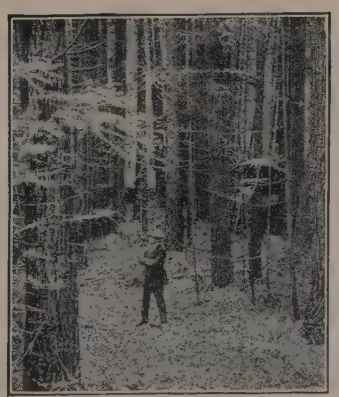
To assure the steady and quick growth of new Redwood forests, The Pacific Lumber Company has inaugurated and is carrying out, under the supervision of experienced forest engineers, a Redwood reforestation program that will provide a perpetual supply of Redwood.

Seedlings transplanted from this and other nurseries, together with natural reproduction from root and stump sprouts, will provide from a dozen to a score of merchantable trees to replace every Redwood cut down today.

In addition to the planting of Redwood seedlings, in cutover sections, where fire has killed new growth, the old Redwood does its part. No sooner is a Redwood cut down, than the stump starts to surround itself with a grove of little Redwoods which sprout from its spreading roots.

In the course of a few years, the more vigorous of these sprouts and seedlings shoot up and monopolize the sunlight, and this survival of the fittest naturally eliminates the weaker and poorer trees.

Forest engineers of the University of California and experts of The Pacific Lumber Company agree that this intensive cultivation through natural reproduction and reforestation with seedlings will, in seventy-five to one hundred years, provide as much usable lumber as the old, past-maturity trees they replace.



Stump sprouts, root sprouts, and seedlings 50 years old

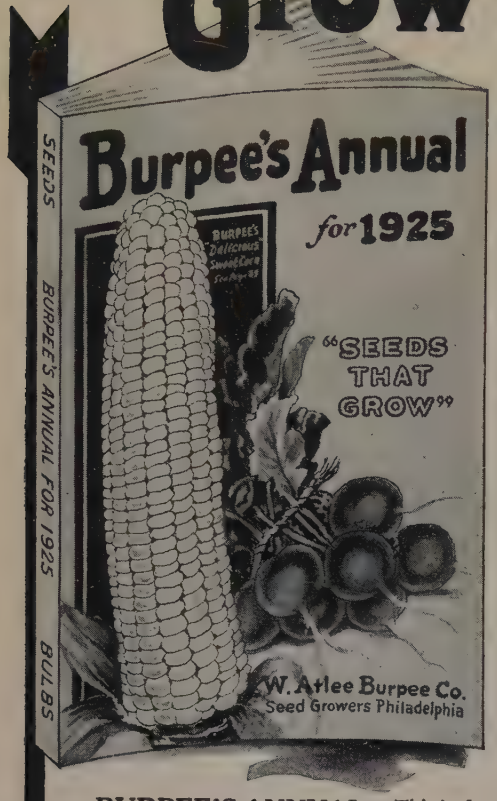
THE PACIFIC LUMBER CO.

San Francisco Los Angeles Chicago New York

The Pacific Lumber Co. Redwood

Natural reproduction, wholly from stump sprouts, 25 years after original cutting

Burpee's Seeds Grow



BURPEE'S ANNUAL. This is the catalog that tells the truth about the Best Seeds That Grow. It describes the

Burpee Quality Seeds

Market growers and florists use Burpee's Annual as a reference book, and still it is so interesting and easy to read that a million amateurs use it as their garden guide.

If you are interested in gardening Burpee's Annual will be mailed to you free.

FREE SAMPLE. First write for a copy of Burpee's Annual; then look through the book and select a regular 10c packet of any vegetable or flower seed entirely free, and we will mail it to you postpaid. This free offer is made to get new customers for Burpee's Seeds and is good only until May 1, 1925.

TEAR HERE

W. Atlee Burpee Co.
SEED GROWERS PHILADELPHIA

Send me **Burpee's Annual,** with order sheet good for a free 10c packet of Burpee's Seeds

B-22

Name _____

R. D. or St. _____

P. O. _____

State _____

Strange Cave Found

Discovery of a natural cave that promises to be more than local in importance and interest has resulted in the withdrawal from homestead entry of 320 acres of public domain in Park County, Colorado, about twenty-eight miles from the town of Fairplay. In recommending the withdrawal, the Secretary of the Interior announced that an examination of the cave will be made to determine whether it is of sufficient scenic quality to be set aside as a national monument or as a national recreational area.

"Rich Man, Poor Man"

"The mockingbird has been called 'the poor man's symphony' because its concerts are more highly appreciated by people who do not pretend to have artistic tastes than are the songs of any other bird," writes R. A. Sell in the *Zephyr*, the bulletin of the Houston, Texas, Outdoor Nature Club. "But it is the 'rich man's symphony' as well, for its ever-changing, cheerful and inspiring song gives courage, independence and restfulness to rich and poor alike. Who cannot meet the cares and vexations and perplexities of a day's work with better grace after hearing the encouraging trill of this master vocalist of the bird world?"

A Value in Trees

Kosciusko, Mississippi, boasts what is believed to be the world's most valuable tree, a pecan tree that at the age of sixteen years recently brought $2,500. It was bought by a nurseryman for grafting purposes, because, although the tree had only been bearing for nine years, it produced enormous pecans weighing twenty-five to a pound. The nurseryman plans to use the tree for the improvement of his stock, thus making it worth far more than $2,500 to its new owner.

For Every Schoolroom

Nature Study Suggestions form a very important and valuable part of the weekly bulletin of the Kansas State Teachers College of Hays, Kansas, entitled Public Service. This department is conducted by Mr. L. D. Wooster, editor of the publication, and is designed to stimulate the preparation of teachers for nature study work in the schools. The department that is conducted carries a very interesting and valuable slogan that might well be adopted in other states, for it dedicates itself to creating "A Nature Corner in every Schoolroom in Kansas."

BUIST'S SEEDS

OUR Free Garden Guide and Catalog is now ready to mail. This book contains 132 pages of expert advice—**also a coupon worth 25c**—on Seed Purchases of $1.00 or more.

Send for a Free Copy Today

Buist's Record—Growing and Supplying seeds of the Highest Grade since 1828.

Free Flower Seeds with orders of 50c and over.

ROBERT BUIST COMPANY
Dept. V Philadelphia, Pa.

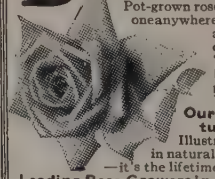
Write for the new Kunderd Catalog—QUICK

SEND for my new 1925 Gladioli catalog at once and get the benefits I offer for early orders. Choice, new varieties of Kunderd Gladioli now offered for the first time. Catalog describes hundreds of varieties. Many illustrated in color. My full cultural instructions are included. Send for the catalog right away.

A. E. KUNDERD, Box 86, Goshen, Ind., U.S.A.
The Originator of the Ruffled and the Laciniated Gladioli

Kunderd Gladioli
Trade-mark
THEY STAND SUPREME

DINGEE ROSES
On Own Roots



Pot-grown rose bushes, on own roots, for every one anywhere. Plant any time. Old favorites and new and rare sorts, the cream of the world's productions. "Dingee Roses" known as **the best** for 74 years. Safe delivery guaranteed anywhere in U. S. Write for a copy of **Our "New Guide to Rose Culture" for 1925. It's FREE.** Illustrates wonderful "Dingee Roses" in natural colors. It's more than a catalog—it's the lifetime experience of the **Oldest and Leading Rose Growers in America.** A practical work on rose and flower culture for the amateur. Offers 500 varieties Roses and other plants, bulbs and seeds and tells how to grow them. Edition Limited. Established 1850. 70 Greenhouses.
The Dingee & Conrad Co., Box 107, West Grove, Pa.

FLOWERS OF GLYNLLISON

Aristocrats of the garden. An Eastern grower rivals the Western Horticultural Wizards. New varieties, new colors, new types. Dahlias, Gladioli, Iris, Hardy plants and exhibition varieties of flower and garden seeds.

Write for unique catalogue of things you cannot get elsewhere.

GLYNLLISON GARDENS
Box E Hayden Rowe, Mass.

Girl Scout Camps

In more than three hundred camps the members of the Girl Scouts were able to get into the out of doors during 1924, according to a compilation by that organization. This is an increase from 46 such camps reported in 1921. So important has become this camp work that an experimental station, called "Camp Andree," is maintained at Briarcliff Manor, N. Y., and there many of the camp directors and councillors are trained.

Tending Volcanos

Responsibility for the behavior of the Hawaiian volcanos has been transferred from the Weather Bureau to the Geological Survey of the Department of the Interior with the shifting of the Hawaiian Volcano Observatory control. Dr. A. T. Jaggar, director of the observatory since its erection in 1912, will carry on his work of keeping tabs on the actions and ructions of Kilauea.

Fires in Idaho

The School of Forestry at the University of Idaho, Moscow, Idaho, has compiled this very interesting statistic, showing the results of fire in that state during 1924. A total loss of 1,867 fires were recorded, of which 921 could be blamed to lightning. Smokers accounted for 236 more of these fires, and 191 were due to the careless camper who failed to put out his fire. There were 146 fires laid at the door of the railroad, and brush burnings accounting for 146 more of these. It is estimated that about 23,850 acres of the undergrowth was killed and that standing timber amounting to about 29,480,000 board feet was destroyed on both national forests and private land.

November Strawberry

On Armistice Day, November 11, at Salt Point, N. Y., Mr. Henry W. Kiemle discovered a number of strawberries in full bloom on the eastern slope of a hill and sent a specimen in to the editor of this department. Of it he remarks that "as the warm, balmy air of Indian summer comes and with it the songs of the ruby-crowned kinglet, bluebird and occasionally that of the white-throated sparrow, we often think that spring has again arrived. If it had not been for the fact that this morning was very misty with a decided chill in the air, these blossoms would have indeed convinced me that fall was nothing but an illusion."

While the Snow Flies and the Garden Sleeps Its Winter Sleep, Plan Its Spring Reawakening

Have your stock selected, ordered and reserved for delivery at the earliest feasible planting date in March, April or May—and best of all—at our low wholesale prices.

DIRECT PROM PLANT FACTORY TO YOU

Some Suggestions

1. SPLENDID HARDY PERENNIALS of all sorts, including hardy chrysanthemums, hardy pinks, canterbury bells, aquilegias, delphiniums, foxgloves, iris, oriental poppies, gaillardias, coreopsis, veronicas, and all other perennials. Any dozen $1.00; any 75 for $5.00; any 160 for $10.00.

2. PEONIES in 20 best sorts; fine large roots of 3 to 5 eyes each; 75c each, $6.00 per dozen.

3. STRONG, HARDY HYBRID TEA ROSE-BUSHES, 3 years old. All the best sorts, such as Ophelia, Columbia, America, Russell, MacArthur, Frau Druschki and 50 others. Any one 75c; any 12 for $6.00; any 100 for $45.00.

4. SELECT DAHLIA NOVELTIES, best new varieties in singles, cactus, show and dec. sorts, $1.50 per dozen; $12.00 per 100.

5. GOLD MEDAL GLADIOLI COLLECTION, comprising the best new CUT FLOWER sorts, in all colors; $4.00 per 100 for good, large bulbs; $35.00 per 1,000.

6. LARGE BEDDING CANNAS AND GERANIUMS, in all colors, $1.50 per dozen; $12.00 per 100.

7. PRIVET HEDGE, $1.50 dozen; BARBERRY HEDGE, $3.00 per dozen. LAWN SHRUBS of all kinds, strong, 4 to 5 years, $1.00 each.

8. SHADE TREES—Maple, ash, oak, poplar, etc., strong, 4 years, $2.00 each. FRUIT TREES, all kinds, $1.50 each.

Special Offer

For all advance orders placed at once for spring delivery you may deduct 20 per cent cash discount.

Order today and save the 20 per cent.

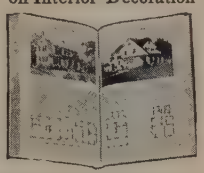
HARLOWARDEN GARDENS

GREENPORT, L. I., N. Y.

No. 1996. Blue print Working Plans only $30.00

200 TESTED HOME PLANS
Cut Building Costs

At last you can get the latest building plans, already tested in the actual construction of homes. A wonderful new book called "Beautiful Homes" gives you 200 of these plans and tells you how to avoid costly errors that often increases the cost of homes $1,000 or more. It enables you to make many short cuts that greatly reduce building costs. You are shown the very latest styles in Stucco, Brick, Tile and Frame Houses and how to choose intelligently between different materials. You are given the latest ideas on Interior Decoration and other helpful data.



FREE Right now a special offer is being made. With this De Luxe Plan Book you receive a year's subscription to Keith's Magazine, the recognized authority on home building for twenty-five years. Just send your name and address, and pay the postman only $3 plus a few cents postage upon arrival. Write at once.

KEITH CORPORATION, 100 No. Seventh St., Minneapolis, Minn.

KEITH CORPORATION,
100 No. Seventh St., Dept. 725-A, Minneapolis, Minn.

Send me "Beautiful Homes" De Luxe Edition and year's subscription to Keith's Magazine. I will pay the postman only $3 plus few cents postage.

Name ----------

Address ----------

City ---------- State ----------

If you send $3 with order, book will be sent postage prepaid

DIRECT FROM GRAND RAPIDS FACTORY

A Modern Classic at Factory Price

A charming occasional table by world-famous Grand Rapids craftsmen. Buying direct from factory saves twelve dollars or more. Walnut or mahogany. Roomy compartment in top; book trough below. Size: 12" wide, 24" long, 24" high. *Shipped freight or express on receipt of price or C. O. D. if you prefer. Shipping weight 28 lbs. Brochure No. 3 describing other pieces on request.*

The GRAND RAPIDS WOODCRAFTERS
GRAND · RAPIDS · MICHIGAN

I Want 700 Agents
At $90.00 a week

Men and Women! Write me today and by this time next week I can place you in a position to make $2.00 to $5.00 an hour in your spare time, up to $15.00 a day full time. Thousands of our representatives are making that and more with our **New Plans.** Simply introduce and take orders for famous **World's Star Hosiery and Underwear** sold direct from mill to home—a complete line for whole family. Permanent customers and repeat orders make you steady, big income. No delivering or collecting. No capital required.

Write Quick It's a chance to make thousands of dollars. Your profits begin at once. Exclusive territory. No experience needed. Write today and I'll send all facts and tell how to start **Free.** *(Established 29 years.)*

WORLD STAR KNITTING CO.
1451 Lake Street **Bay City, Mich.**

Nature Study Society

Added emphasis was placed upon the remarkable extension of nature study in the schools at the meeting of the American Nature Study Society held in Washington in December. Many of those active in the work of furthering nature study among the school students, reported upon steps that have been taken in various parts of the country, and considerable exchange of valuable information was derived from the meeting. Open forum discussion was devoted to the relation of nature study to various other studies and to the question of coordination of this work. Among the speakers on the program were Mrs. Elizabeth K. Peeples, supervisor of nature study in schools of Washington, and editor of the Nature Study Suggestions in NATURE MAGAZINE; Mr. Vernon Bailey, Chief Field Naturalist, United States Biological Survey, and a member of the Consulting Board of the magazine; Mrs. John D. Sherman, president of the General Federation of Women's Clubs; Prof. E. Lawrence Palmer, Professor of Rural Education at Cornell University; and Mr. Arthur Newton Pack, associate editor of NATURE MAGAZINE.

Forest Utilization

Declaring that a tree saved is a tree grown, and that to bridge the gap between timber consumption and timber growth calls for thrifty and economic measures by the wood-producing, manufacturing, and consuming industries, President Calvin Coolidge sounded a key-note at the Forestry Utilization Conference held in Washington on November 19 and 20. "The time is at hand when our country is actually confronted with a timber shortage that can be remedied in only two ways: by diminishing the present waste and increasing the present supply," the President declared. In his address he dedicated himself to a forward looking forest conservation and reconstruction program. He pointed the way for the action of this meeting and other meetings aiming at the same goal. Various instances of forest conservation and forest utilization were presented to the meeting by representatives of industries and corporations. A committee on permanent organization was named, and on its recommendation the task of carrying forward the work of the Utilization Conference was referred to the Central Committee on Lumber Standards now operating under the Department of Commerce.

FREE Write for BOOK
Strawberries

Is your land yielding a satisfactory profit? Here's an amazing new FREE book that tells how to make it yield $500 to $1200 per acre. Thousands are making these profits. Others, who have only a very small space are having their own strawberries free and making cash profits of $50 to $200 besides. Send us your name and address—a postal will do—and we'll send you your copy. This book also tells about raspberries, blackberries and grapes. Remember it's FREE. (16)

R. M. KELLOGG CO.
Box 6216 - Three Rivers, Mich.

Flower Seeds
Order Now for Your Early Garden

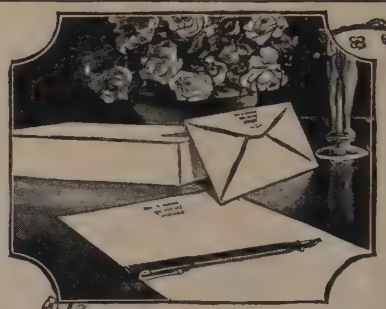
5 generous pkts. Mailed postpaid for **10c**

The following collection blooms from early summer to late fall: **Calendula, Allyssum, Pansy, Snapdragon, Coxcomb.**

OUR MIXED GLADIOLI COLLECTION deserves a place in every garden. All colors, shades of yellow, white, pink and crimson. Bloom throughout the summer season. Bulbs can be planted any time this spring. **We will mail 25 bulbs, all blooming size, postpaid, 50c. Send your order today.**

New Catalog Free. Lists all of the most beautiful roses grown, plants, ferns, climbing roses, and everything for the flower garden. Once a customer, always one.

MISS ELLA V. BAINES, Dept. 10 SPRINGFIELD, OHIO



Give Your Letters That Personal Touch

Write them on stationery that bears your name and address. At our low price, it will cost you no more than you have been paying for plain paper and envelopes.

PRISCILLA PERSONAL PRINTED STATIONERY **$1**
200 Single Sheets, 6x7 inches
(Printed with name and address)
100 Envelopes to match
(With same printing on the flap)

Print or write your name and address *plainly* (not more than 3 lines) and send it with a dollar bill or money order for $1. If west of Denver, add 10c for extra postage. We will send you promptly a box of Priscilla Personal Printed Stationery with your name and address neatly printed in rich Blue upon pure White Bond paper. If not pleased, return it; we'll send back your dollar plus postage. Order today from this advertisement.

HERMAN GOLDBERGER
110-O High Street Boston, Mass.
In business since 1899

VICTOR Portable STEREOPTICON
THE PERFECT LANTERN SLIDE PROJECTOR
SHIPPED ON APPROVAL
THOUSANDS OF SLIDES FOR RENT OR FOR SALE
WRITE FOR INFORMATION
ASK FOR CATALOG AND TERMS
VICTOR ANIMATOGRAPH CO. INC.
239 VICTOR BLDG. DAVENPORT, IOWA.

See How Soon You Can Start A Fortune

Make This Test

No matter how small your income now is, if you know how, you may become financially independent in a very few years. A valuable book—now free—will enable you to make the test which is showing hundreds of ambitious men the road to success.

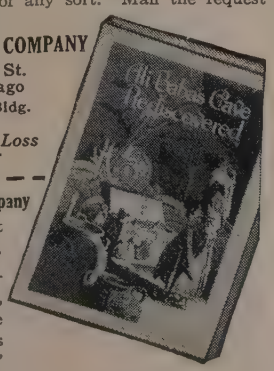
No matter how small your income may be nor how great your responsibilities, here is a plan that will make it surprisingly easy for you to build up a comfortable sum—and in a comparatively short time.

Are you aware that a few cents each day, or a few dollars each week, can be invested so that it will double itself in a surprisingly short time with absolute safety?

Do you know how to invest a part of your salary in legitimate securities and then reinvest the interest in such a way that you will have a comfortable fortune in just a few years?

In an unusual book called "Ali Baba's Cave Rediscovered" you are told exactly how to discover the fortune that lies hidden in your salary. It tells you how much to set aside each month to accumulate $10,000, $25,000, or even $50,000, in a certain time. It outlines an unusual plan for the scientific accumulation of money. It shows how you can create a good sized estate through investing in Forman First Mortgage Gold Bonds—all without risk or speculation of any sort. Mail the request blank for your copy.

GEO. M. FORMAN & COMPANY
105 W. Monroe St.
Dept. 871, Chicago
Pershing Square Bldg.
New York
40 Years Without Loss to a Customer



Geo. M. Forman & Company
105 W. Monroe Street
Dept. 871, Chicago, Ill.

Please mail me, without cost or obligation, a copy of your Free book, "Ali Baba's Cave Rediscovered."

Name.....

Address.....

City.....State.....

"Number, Please?"

We have heard various stories of wire tapping, but the telephone companies have another tale of this kind in which the chief actors are Bruin, the busy woodpecker, Mr. Gray Squirrel and others. According to the *Telephone Review*, bears shuffling through the woods are often attracted by the buzzing of the telephone wires above. Feeling sure they have traced a beehive, they go aloft among glass bulbs that adorn the crosspieces and frequently smash the glistening miniature beehives, upsetting the service. The gray squirrel has a way of nibbling at the cable. The white-headed woodpecker in the State of Washington frequently does an efficient job of pecking a pole to the verge of breaking. The eagle occasionally causes a short circuit with the sweep of a powerful wing.

Forest for Palestine

Through cooperation between villagers, private individuals, municipalities, institutions and the government, about three million trees were planted in Palestine between 1920 and 1924. The war wrought havoc of what remains of the former wooded wealth of this country. The government nurseries have been drawn upon to supply aid in this work, and most of those cooperating were able to secure their planting stock free of charge.

Eclipses and So Forth

There is a wide and general interest in the skies and stars, and one of the most interesting phenomena of the heavens is that of the solar eclipse. It merits a volume all its own, and this Mrs. Isabel M. Lewis of the United States Naval Observatory, and a contributor to NATURE MAGAZINE, has provided in a book published by Dundee & Company and entitled "A Handbook of Solar Eclipses." The book treats particularly with the total eclipse of January, 1925, but with eclipses generally and constitutes not only a valuable and interesting contribution to the subject, but a textbook as well.

Friends of Mankind

Evolution of the barnyards is the subject of an interesting and most enjoyable volume entitled "Friends of Mankind," by Douglas English, and published by E. P. Dutton & Company. Mr. English is a distinguished British authority on animals and animal life, and an internationally famous photographer of animals. In his volume he traces the history of the farmer back to our ape-like ancestors and de-

Make This Test

A Warm House When You Arise

This Easy Inexpensive Way

For healthy rest, sleep with windows open. But keep the rest of the house warm. Chamberlin Inside Door Bottoms enable you to admit fresh air to any part of the house, while sealing all other parts against drafts.

Try This Experiment

Open your bedroom windows. Close the door, then place your hand at the crack between the bottom of the door and floor. Note the draft of cold air which rushes through the crack into the hall.

Try this at the attic and basement as well. There will be a draft at each. It goes on all night from bedrooms, constantly from the basement, while warm air escapes to the unused attic. That is why bath and breakfast rooms are almost always cold in the morning.

CHAMBERLIN METAL WEATHER STRIPS
"SINCE 1893-THE STANDARD"

Inside Door Bottoms End All This

Send the coupon below or write us for an estimate on the cost of equipping your home with inside door bottoms.
We gladly furnish free estimates covering the cost of installing weather strips or inside door bottoms or both in your home. When installed they are guaranteed for the life of the building. Simply mail the coupon. It costs nothing to learn how low the price of early morning comfort and coal saving.

Chamberlin Metal Weather Strip Company
1632 West Lafayette Boulevard, Detroit, Michigan

I would like an estimate covering the cost of installing (check which)

Chamberlin Inside Door Bottoms—

Chamberlin Metal Weather Strips—In my home—Office Bldg.—Church—Number of Windows—Number of Doors—

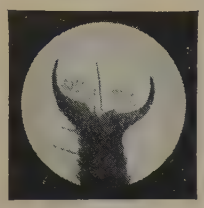
Name _____

Address _____

City and State _____

Eng. Dept. N-13

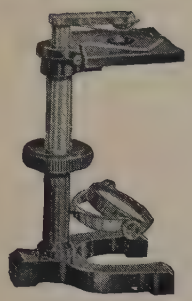
Wonderful New Ultralens Microscope



This is what the tip of a fly's leg is like, magnified 225 diameters, when seen thru the

Ultralens Microscope

At last the high powered microscope is within the reach of all who wish to study, observe and experiment with the vast world of minute objects that are invisible to the naked eye. A remarkable discovery enables us to manufacture the Ultralens Microscope (magnifies 225 diameters) for **one-eighth the usual cost.**



EASY TO USE—Any amateur can immediately start using his Ultralens to examine the edge of a razor, the mesh of a cotton shirt, the bacteria in dirty water. No technical training required, yet hundreds of scientists and teachers are using this instrument today. It is at once interesting, instructive, and scientific. Gives enormous magnification and perfect definition.

COMPACT—The Ultralens Microscope comes packed in a beautiful Bakelite case with full instructions that anyone who can read can understand. Lenses of 125 x and 325 x objectives can be furnished at $1.50 each.

MAIL ORDER NOW—Order direct from this advertisement and get your Ultralens Microscope now. Makes a highly appreciated gift for young or old. Fully guaranteed. If you desire more information before purchasing send for free descriptive catalog.

$7.50
for Complete Outfit, prepaid

SCIENTIFIC APPARATUS CORP.
Dept. 205 **MILTON, PA.**

JUST OFF THE PRESS

A Beautiful New Bird Book

FOR CHILDREN

Grown-Ups As Well

"The Bird Foot Race in Follies"

By R. E. SAMIS

This Book is Different

Two hundred and fifty verses of bird talk, educational, comic and speedy. Eighty-one wonderful pictures in colors by Bruce Horsfall and others. Printed on best white enameled paper. Eighty pages. Highly decorated cover. Size 11 by 13 inches.
A book that will delight any child.

Price $3.50, postpaid

Order from

American Nature Association
1214 16th St. N.W. **Washington, D. C.**

THAT WE MAY KNOW EACH OTHER BETTER

Special Bargains to Introduce Rosedale Products to the readers of NATURE MAGAZINE are offered below:

12 CHOICE ROSES, $7. Full-size plants; fine assortment of colors of ever-blooming varieties, selected from our extra heavy stock, 2-year, field grown.

20 LOVELY IRIS, $3. These are select Victory (German) Iris; 4 each of five varieties or 2 each of ten varieties. A real treat for Flower Lovers.

BOTH COLLECTIONS $9. You will be delighted with the beauty, vigor and variety of these Rosedale Plants. One half of each collection, **6 Roses and 10 Irises, $5.**

For complete list of choice Perennials, Fruits, Roses, Shrubs and Trees, write for Spring Catalogue today.

Box N **ROSEDALE NURSERIES** **Tarrytown, N. Y.**

scribes the changes the centuries have made in the sizes and habits of animals. He treats of cows, goats, sheep, poultry, dogs, pigs, cats, horses, etc. In addition to this he makes his story of great interest, combining both scientific facts, imagination, humor, and valuable practical information. It is a book that is rather out of the ordinary.

Fascinating Corals

"An Introduction to the Study of Reef Corals" is the title of a beautifully prepared and admirably executed volume by Sydney J. Hickson, Professor of Zoology in the University of Manchester, and published at the University Press and by Longmans, Green & Co. While the volume is entitled an introduction, it is remarkably complete in its consideration of the corals, and not only constitutes a volume of value to the student of pure science, but it has its economic value in the study of the problems of distribution and variations of the coral reefs of the world. The author states that his only intent in the volume has been, however, to place before the reader a short description of a few illustrative genera of each of the groups of animals and plants that form coral reef structures. It will serve as a handy introduction to study and to help distinguish the corals belonging to the different groups.

The Finest Pearls

"Some of the finest pearls in the world have come from the Gulf of California," says Vernon Quinn in his book "Beautiful Mexico," published by Frederick A. Stokes Co., New York. "For centuries before the Spaniards arrived in Mexico the natives were engaged in pearl-fishing in these waters; for in some remote time they discovered that the pearl was a jewel of great beauty. The pearls usually are white, but they are found in almost every color, and some are of immense value. One, found near La Paz, of an exquisite rose color, was sold for $50,000. Many of the most beautiful pearls among the royal jewels of every country in Europe came from the Gulf of California. Mexico's pearl industry today is estimated at about three million dollars annually. Much of the pearl-fishing is done by the natives, clothed only in a belt to which their basket is attached. They can remain below water for a minute or more before they must come to the surface for air. The Gulf of California is infested with sharks, and a native diver will never go down without first having a shark-charmer mutter his incantations over him. The shark-charmers follow the Indians from place to place and gain a good livelihood by their magic processes of frightening off the voracious fishes."

Motion Picture Portraits

Are Life's ONLY Replica!

Every natural expression is faithfully recorded—*true to life*—

THE VICTOR CINE CAMERA takes your pictures in life-motion just as easily as you now take the ordinary lifeless "stills."

THE VICTOR CINE PROJECTOR shows your own motion pictures in truly professional style. And, too, you may rent features, comedies, dramas, and travelogues from the Kodascope Libraries.

Victor Cine Camera - - - $65.00
Victor Cine Projector - - 45.00

Ask your dealer or write

VICTOR CINE SALES CORP.
DAVENPORT, IOWA

Geneva Binoculars

Finest glasses the money will buy

A glass for every use and every pocketbook.

4 to 20 Power
$12 to $60

Every glass sold on 10-day trial and guarantee of absolute satisfaction or money back. Get the Geneva price list first.

"Brings the view close to you."

Send For Descriptive Circular Today

Geneva Optical Co., 39 Linden St., Geneva, N.Y.

Women delighted with new dignified pleasant way to make $50 and more a week.

Make Money Taking Pictures!

We train you quickly at home. No experience necessary. Spare time or full time. Professional camera free. Photographs in big demand by magazines, newspapers, advertisers, etc. Also train you to take better portraits than the average professional photographer! Equip you to make $50 to $100 a week in business of your own. New plan. Nothing else like it. Write today for amazing details.

International Studios, Inc.
Dept. 1671 3601 Michigan Ave., Chicago, Ill.

YOU CAN OIL PAINT

Amazing new method teaches men or women to earn after first lesson. OIL PAINT photos at home—portraits, landscapes or art subjects. Earn $18 to $100 and more a week. FREE OIL PAINT OUTFIT. Graduates furnished employment. Send now for free illustrated book.

PICTORIAL ART STUDIOS, INC.
Dept. A-04, 2731 No. Clark Street; Chicago. Ill.

Tom and Bob

(CONTINUED FROM PAGE 36)

springs, their bones unbreakable. Where would it end?

It ended in a cat fight, of course. Such boisterous spirits must find an outlet, and it had to come to the time when brotherly love failed. One of them must be master. A mere excuse was needed to start the battle.

The kittens were playing, rolling and tumbling on the lawn. Bob was the leading spirit these days and was usually on top. Instead of playing with his claws sheathed, he went at the game with a will and showed too much zest in bulldozing his brother. Tom, on the other hand, rolled quickly on his back and put up all four big paws, his ears laid close, with an expression of watchful defense on his face. There was a lull. Then the storm of battle broke. A surge of conquering frenzy seized Bob. Like a flying demon, he launched at the other cat, scratching and biting everywhere at once. The snarling and caterwauling were deep-throated and ominous. Tom broke away and ran for the cover of brush on the hillside. Nor could anyone approach his refuge that he did not crouch back and snarl. Fear, the ruling passion of the wild, had taken possession of him.

This settled it. When, after several hours of maneuvering and coaxing, Tom was brought back to the fold, it was to find that he and his bullying brother had been assigned to large, sunny quarters on the side hill where they could roll on the cool ground and grass. A wire netting between them discouraged any further set-to. It also restored to a certain degree Tom's self-confidence. He had his own pans of milk, water and other food, so he didn't have to share or fight for them.

When Tom and Bob couldn't be together more than to run along the wire partition and bounce near each other, they discovered they had lost that thing which they loved best, to romp and play together. Then they were given short intervals when the door was open, and with what abandon they raced about! They were reckless in their leaps and falls, often landing with a thud that might knock the wind out of an ordinary animal; but their bodies were like rubber. Within a short time, they learned to be good fellows and respect each other's rights in the way of food. The fighting mood had passed, and from that time on they were inseparable. If one was taken out for a walk, the other was restless and howled incessantly.

The twins were so much alike in size and markings that it was difficult to tell them apart except by disposition. Bob was bold and came first to be petted. The dominant factor, fear, so strong in creatures of the wild, was no part of him. He it was that first started the trick of landing on one's back and lapping an ear or cheek

SALE! 300 BRAND-NEW "Lefils" BINOCULARS

Former Price $30.00

NOW, while they last,

$18.50

8 Power Stereo-Prism

Another of our wonderful quick-action offers—too good to last long. Every one of these 300 genuine "Colmont-Lefils" Stereo-Prism Binoculars are BRAND-NEW—NOT salvaged "war glasses" made up from "rejected parts." This is the last lot of a shipment purchased by us when the French rate of exchange was much lower than now.

Money back if you can find equal quality at this price

This splendid "Lefils" binocular is one of the lightest, most compact 8-power glasses made. Weighs but 15 ounces, yet has large, extra luminous lenses. New shape enables use of the long extension formerly used only in much higher priced glasses. Fine for Nature study, big game hunting, on hikes and auto trips. Equally sharp definition in extreme distance or close by. Wonderful bargain. Only 300 more at $18.50. Complete with handsome case and straps. Next lot will cost more: Order direct from this ad. Money back if you return glass.

FREE—Catalog of over 200 glasses

The world's finest binoculars, 3 to 24 power. Telescope for sports, observation, target shooting, etc.

Write to America's Leading Binocular House

DU MAURIER CO. Dept. 81 Elmira, N. Y.

FREE

$20 Fine Tone Musical Instruments

We have a wonderful new copyrighted system of teaching note music by mail! To first pupils in each locality we will give free a $20 superb Violin, Tenor Banjo, Ukulele, Hawaiian-Guitar, Banjo, Mandolin, Banjo-Ukulele, Banjo-Mandolin, Cornet or Banjo-Guitar absolutely free. Also teach Piano and Organ. Very small charge for lessons only. Four lessons will teach you several pieces. Over 100,000 successful players. We guarantee success or no charge. Complete outfit free. Write today. Dept. 162 No obligation.

Slingerland School of Music, 1815 Orchard St., Chicago, Ill.

BECOME A LANDSCAPE ARCHITECT

Dignified, exclusive profession. Little competition. $5,000 to $10,000 incomes for experts. Easy to master under our correspondence methods. Assistance extended to students and graduates. Write today for full details.

American Landscape School, 83-HA, Newark, New York

WANT WORK AT HOME?

Earn $18 to $60 a week RETOUCHING photos. Men or women. No selling or canvassing. We teach you, guarantee employment and furnish WORKING OUTFIT FREE. Limited offer

Write today. ARTCRAFT STUDIOS ad Dept. C, 3900 Sheridan Ro, Chicago

STUDY AT HOME

Directed by

The University of Chicago

Courses in English, History, Chemistry, Business, Mathematics, Education, Psychology, and 35 other subjects command credit toward a Bachelor degree. Begin any time. Address 33 Ellis Hall, University of Chicago, Chicago, Ill.

Victor Lantern Slides

426 Rental Sets — 26000 Stock Slides
Special Slides mad -to-order —

Ask for supplement of 1924 releases

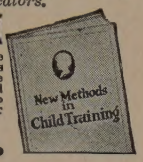
VICTOR ANIMATOGRAPH CO.
299 Victor Bldg. Davenport, Iowa.

NEW WAY TO TRAIN CHILDREN

SOMETHING MORE than love is due a child. And this is the right training—training that builds sturdy health of body, firmness of mind, nobility of character. Now, for the first time, there is a scientific method of child training founded on the principle that confidence is the basis of control. This new system shows you how to correct the *cause* of disobedience, wilfulness, untruthfulness and other dangerous habits. It *removes the cause*—not by punishment or scolding but by confidence and cooperation along lines which are amazingly easy for any parent to apply.

Highest Endorsements This system, prepared especially for the busy parent, is producing remarkable and immediate results for thousands of parents in all parts of the world. It is *endorsed by leading educators.*

FREE BOOK



"New Methods in Child Training" is the title of a startling book which describes this new system and outlines the work of the Parents Association. Send letter or postal today and the book will be sent free—but do it now as this announcement may never appear here again.

THE PARENTS ASSOCIATION
Dept. 1191 Pleasant Hill, Ohio

The Parents Association,
Dept. 1191, Pleasant Hill, Ohio

Please send me your booklet, "New Methods in Child Training," and information about the Parents Association, free of charge. This does not obligate me in any way.

Name.....

Address.....

City.....State.....

Check this square if you would also like to receive full information about the Berry Educational Playbox, an amazing New Kind of Play.

FURNESS-BERMUDA-LINE

(Bermuda Gov't's Official Contract Steamers)

BERMUDA

Playground of Eternal Springtime

(Average Yearly Temperature of 70°)

Only 2 Days from New York

Sailings Twice Weekly From New York, Wed. and Sat.

Tickets good on either Steamer, insuring unequalled express service and via New Palatial Twin-screw Oil-burning Steamers,

S.S. "FORT VICTORIA"
S.S. "FORT ST. GEORGE"

No Passports—Modern Hotels—All Sports, including Golf, Tennis, Sailing, Bathing, Trap Shooting, Horse Racing, Fishing, Riding, Driving, Cycling, etc.

ST. GEORGE HOTEL, Bermuda
Especially attractive, located in the historic, picturesque and quaint part of Bermuda. Excellent cuisine and service. Magnificent tiled swimming pool.

WEST INDIES CRUISES
Delightful Cruises to the Gems of the Caribbean Sea.

For Illustrated Booklet on Bermuda or St. George Hotel or West Indies, write

FURNESS BERMUDA LINE
34 Whitehall St., N. Y., or Any Local Tourist Agent

ENTERTAINMENTS

PLAYS How to Stage them, Dialogs, Recitations, Drills, Speakers, Monologues, Folk Dances, Operettas, Pageants, Musical Readings, Comic Songs, Motion & Pantomime Songs, Shadow Plays, Tableaux, Special Entertainments for all Holidays, Minstrel Shows. Hand books. Make-Up-Goods, etc. For all ages and occasions. Large catalog **Free.**

T. S. DENISON & CO.
623 So. Wabash, Dept. 135 CHICAGO

New **Minstrel Shows,** Musical Comedies, and Revues, suitable for high school and college presentation.

with his rough tongue. Next to playing with his own brother, he liked to follow and romp with Peter, a little dog of his own size. Tom, on the other hand, was haunted by fear. In the open, his instinct was to seek the cover of a bush or spring into the limbs of a tree. Although the gentler of the two, his wild instincts were more marked.

If the kittens of a wild mother can be tamed and their natural traits softened in so short a time, what might one accomplish in two or three generations? Tom and Bob still remain two of the most interesting wild animal characters we have studied. How did they overcome the instincts inherent in their race? The question can be answered in the remarkable keenness of the animal mind and his ability to comprehend and adapt himself to conditions and environment. Not the least is the human sympathy and kindness that replaced a hereditary enmity and distrust.

The Wolverine

(CONTINUED FROM PAGE 41)

desperate race with the destructionists.

Dr. Hornaday, than whom there is no keener or more accurate observer of animal life, places the wolverine high up in his famous "Hundred Per Cent Table," classing him above such well-known and intelligent animals as the grey wolf and gorilla, and just below the beaver and the grizzly bear. The wonderful fellow certainly deserves the worthy doctor's 100 per cent for perfection in the matter of originality of thought and reasoning powers, because no animal in all the world can perceive, and circumvent, a human's intentions more rapidly than he.

The late Napoleon Comeau, that unsung zoologist of the north country, told the writer just a few weeks before he died of a wolverine that had been regularly breaking into a fisherman's cabin and scattering its contents about the place. For two long months the fisherman vainly matched his wits against those of the depredator till he was ready to give up in dispair. Carefully disposed, poisoned meat was left untouched, traps were mysteriously sprung, and deadfalls "pulled" with disheartening regularity.

Then the curé of that wide-flung parish, the black-robed missioner of the coast, took a hand in the game. The curé was convinced from the very onset that the trap was the only effective means whereby his capture could be effected, and careful observation proved beyond a doubt that the wily rascal was setting off the traps by *inserting his paw under the jaws and jabbing the spring till they were released.*

It cost the indefatigable priest two cold, sleepless nights in a balsam to learn this fact, but he effected the capture of the cunning brute, this renegade of the wilderness, by simply *reversing the traps, jaws downward.*

Easy to Play
Easy to Pay

BUESCHER
True-Tone
Saxophone

BENNIE KRUEGER Director Bennie Krueger and His Orchestra. Brunswick Records.

Easiest of all instruments to play and one of the most beautiful. Three first lessons sent free give you a quick, easy start—in a few weeks you can be playing popular tunes. You can take your place in a band or orchestra in ninety days, if you so desire. Most popular instrument for dance orchestras, home entertainments, church, lodge and school. A Saxophone player is always popular socially, and has many opportunities to earn money. Six Days' Trial and easy payments arranged. (178)

Free Saxophone Book Shows all Buescher models and gives first lesson chart; also pictures of famous professionals and orchestras. Just send your name for a copy. Mention any other instrument in which you may be interested.

BUESCHER BAND INSTRUMENT CO.
Everything in Band and Orchestra Instruments
456 BUESCHER BLOCK - - ELKHART, INDIANA

---

200 Sheets—100 Envelopes

$1.00 Postage Prepaid

High grade, clear, white bond paper—unusually smooth writing surface. Size 6 x 7 inches with envelopes to match. Has that crisp, crackly "feel" that identifies it to everyone as superior quality stationery. Special handy box keeps paper and envelopes in order and easily reached, preventing waste.

Your Name and Address Printed FREE!
on every sheet and envelope, in rich dark blue, up to 4 lines. Type is Plate Gothic, designed especially for clearness and good taste. Makes a personal stationery you will be delighted to use. An ideal gift printed with your friend's name. This stationery, unprinted, would ordinarily cost you more than $1.00; our large production at narrow margin makes this special offer possible.
Just send your name and address (write or print clearly) with $1.00 (west of Denver and outside the U. S. $1.10) and this generous box of stationery will come to you neatly packed, postage prepaid. Money returned if you are not more than satisfied. Order today!

National Stationery Co. 1451 Lincoln Highway Batavia, Illinois

---

I PAY MEN $100 a week

Make $100.00 a week and up, selling our fine made-to-measure, all-wool suits, direct to wearer. **Biggest values—positively sell on sight.** Biggest commissions paid in advance. We attend to delivery and collections. 6x9 swatch samples—over 100 styles all one price—furnished **FREE.** Part or full time men write at once.

W. Z. Gibson, Inc., 161 W. Harrison St., Dept. A-287 Chicago

PLAY A TUNE IN 10 MINUTES! On Ukulele, Banjo Ukulele, Mandolin, Tenor Banjo or Guitar. Amazing new invention. **No knowledge of music necessary;** no practice—you can play tunes right away. Easily attached to any instrument. Simply press numbered keys. Finer tone than when played the old way. Send for **FREE** BOOK and bargain catalog of musical instruments. No obligations. Have fun, money, popularity. Write today.

Free Book

FERRY & CO., 3222 N. Halsted St., Dept. 1451, Chicago, Ill.

Smart Stationery

$2.00 100 DOUBLE SHEETS AND 100 ENVELOPES NOW ONLY $2. per BOX EMBOSSED *(not printed)*

Society and stage people use this beautifully **embossed,** rippled bond paper. White, Sand, Blue or Grey paper with either Blue, Black or Jade Green **embossing.** Quick delivery postpaid for only $2. **Print Plainly** wording and monogram desired.

WESTMINSTER ENGRAVO CO.,
Dept. C, 311 Fifth Ave., New York

THROVGH BOOKS TO NATVRE

OVR BOOK HOME

Books Recommended for Home and School

For the Lovers of Nature

BOOKS ABOUT TREES AND FORESTRY

	Price
Trees as Good Citizens—Charles L. Pack	$4.00
School Book of Forestry—Charles L. Pack	1.00
Tree Habits—How to Know the Hardwoods—Illick	4.00
Forestry Almanac—American Tree Association	2.00
Tree Guides—Rogers	1.50
Our Native Trees—Keeler's	3.00
Northern Shrubs—Keeler's	3.00
Field Book of Trees and Shrubs—Matthews	3.50
Tree Guide—Lounsberry	4.00
Farm Woodlands—Berry	1.20
Our Vanishing Forests—Arthur Newton Pack	2.00
Nut Growing—Robert T. Morris	2.50

BOOKS ABOUT BIRDS

American Birds—Finley	3.00
Birds of East N. A.—Chapman's	4.00
Color Key to N. A. Birds—Chapman's	4.00
Wild Birds and Their Music—Matthews	3.50
Birds East of the Rockies—Reed's	1.50
Western Bird Guides—Reed's	1.75
Bird Book—Burgess	3.00
Water and Game Birds—Reed	1.50
Handbook of Birds of the Western United States—Florence Merriam Bailey	5.00
Birds of Village and Field—Florence Merriam Bailey	2.25
Bird Behavior—Frank Finn	5.00
The Children's Book of Birds—Olive Thorne Miller	2.00

BOOKS ABOUT ANIMALS

Animal Book—Burgess	3.00
Animals—Stone & Cramer	5.00
The Minds and Manners of Wild Animals—William T. Hornaday	2.50

BOOKS ABOUT INSECTS

	Price
Manual Study of Insects—Comstock	$4.25
Insect Book—Lutz	3.50
Insect Book—Howard	5.00
How to Know the Butterflies—Comstock	3.50
Butterfly Guide—Holland	1.50
Spider Book—Comstock	5.00
The Children's Life of the Bee—Maurice Maeterlinck	2.00
Insect Adventures—I. Henry Fabre	1.40

BOOKS ABOUT ASTRONOMY

Friendly Stars—Martin	2.00
Ways of the Planets—Martin	2.00
Call of the Stars—Kippax	4.50
Comstock Star Maps, per set	.25

BOOKS ABOUT FLOWERS AND PLANTS

Flower Book—Burgess	3.00
How to Know the Flowers—Dana	3.00
Wild Flowers East of Rockies—Reed	1.50
Western Flower Guides—Saunders	1.75
Field Book of Western Flowers—Armstrong	3.50
Field Book of Wild Flowers—Matthews	3.50
How to Know the Ferns—Parsons	2.50
Fern Lovers' Companion—Tillston	3.00
Mosses—Durham	2.50
Weed Book—Georgia	3.00
Our Ferns in Their Haunts—Willard Nelson Clute	3.00
The Wild Flower Book for Young People—Alice Lounsberry	2.50
Useful Wild Plants—Charles Francis Saunders	3.50
The Human Side of Plants—Royal Dixon	1.75
American Honey Plants—Frank C. Pellett	3.00

THE AMERICAN NATURE ASSOCIATION

Order direct from Our Book Home

Nature Department, Comstock Publishing Co. Cornell Heights, Ithaca, N. Y.

A Gift Every Month for 12 Months

There is no gift that will give more unalloyed pleasure to the child, relative or friend in whom you are interested than these fascinating books by Charles Lathrop Pack, President American Tree Association, and the unique NATURE MAGAZINE for 12 months.

Three Wonderful Books

and

NATURE MAGAZINE (One Year)

The most popular Nature Periodical ever published

All for $8.00

THE SCHOOL BOOK OF FORESTRY—The story of our forests past and present. Should be in every home. Sold separately for $1.00.

TREES AS GOOD CITIZENS—A complete book about shade trees (how to identify, select, grow and care for them)—a popular book for the home owner, lover of trees, educator and student. This book alone $4.00.

TREE HABITS—HOW TO KNOW THE HARDWOODS—The most complete book of its kind ever published. Descriptive of all the hardwoods in America. Price is $4.00

Well printed; beautifully illustrated with photographs (16 color plates in one); Sketches. Cloth bound with gilt lettering.

NATURE MAGAZINE—A popular monthly with 64 big pages each month, full of exquisite pictures and fascinating articles about that most entrancing of subjects, "Nature." Regular price, 35 cents a copy.

Order from American Nature Association
Washington, D. C.

NATIONAL CAPITAL PRESS, INC., WASHINGTON, D. C.